

A NEW
E S S A Y
O N T H E
V E N E R E A L D I S E A S E : 7/39
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Or, Every Person afflicted with that Disorder
T H E I R O W N P H Y S I C I A N .

W I T H
An Anatomical Description of all the Parts that serve
for *Generation*, both in *Male*, and *Female* :

Of the Whole Anatomy of the Womb, and the Membranes
involving the Foetus: Of the Humours and Air contained
in them: Of the Umbelical Vessels: Of the Nourishment
of the Foetus, and its Posture in the Womb.

A L S O ,
Of the C O N C E P T I O N and B I R T H ;

A C C O R D I N G T O T H E
Doctrines of the most accurate & learned Modern Anatomists.

To which is prefixed,
A Prescription to prepare a Restorative MEDICINE
For all Kinds of Weaknesses, whether Acquired or Natural.

By S. FREEMAN, M. D. and MAN-MIDWIFE.

The S E C O N D E D I T I O N , with A D D I T I O N S .

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NEW

ESSAYS

ON

VEPERRAL DISSEASES

OF EVERY PART OF THE HUMAN BODY

THEIR OWN PHYSICIAN

BY

AN ANATOMICAL DESCRIPTION OF THE HUMAN BODY
FOR THE USE OF THE STUDENT AND PRACTICE

OF THE WHOLE ANATOMY OF THE HUMAN BODY
INCLUDING THE HISTORY OF THE HUMAN BODY
IN THE STATE OF THE WHOLE BODY
OF THE PARTS, AND THE HISTORY OF THE WHOLE

THE CONSTRUCTION OF THE HUMAN BODY

OF THE HUMAN BODY



THE HUMAN BODY

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THE HUMAN BODY

P R E F A C E.

THE ingenious Sir William Temple says, "If riches could always purchase ease, or if honours could make distempers keep their distance, and force away certain disorders, and pay respect to quality, who would not be covetous, and with reason? Who would not be ambitious, if Health were at the command of power, or might be restored by honour? But, alas! a white staff will not help the lame to walk better than a common cane; nor a blue ribband bind up a wound so well as a common fillet: the glitter of gold and of diamonds will but hurt sore eyes, instead of curing them; and an aching head will be no more eased by wearing a crown than a common night-cap: Croesus himself, when sick, was a poor creature. Health is the soul that animates all the pleasures of life; and, without it, a man starves at the best and greatest tables, makes faces at the noblest and most delicate wines, is poor and wretched in the midst of the greatest treasures and fortunes. Without Health, youth loses all its vigour, beauty all its charms; the softest music grates in our ears; conversation is disagreeable; palaces are prisons, or of equal confinement; riches are useless (as to enjoyment;) honour and attendance are cumbersome; and crowns themselves a burden."

No sooner had our fallen nature subjected us to diseases, than the all-bountiful Creator was concerned for our relief: He not only ordered our parent earth to bring forth nourishment for our bodies, but physic for our diseases, and artists to administer it.

In the early days of Antiquity, this supply was little wanted; men, guided by the laws of temperance, lived till nature, quite exhausted, dropt untortured into the silent grave. Their simplicity required no physical alteratives, and exercise was their cathartic. But no sooner had luxury and intemperance appeared, than man sadly complained and

longed for greater help. As these parents of misery, and of empires downfal, increased, (witness Oh Greece, and let Rome declare) so did diseases, both in number and degree; and thus have they kept pace together to the present day.

At first, physic was confined to a few simple herbs, and their healing virtue was generally learnt from accident: but in our days, now diseases are become inveterate, from luxury and debauchery so complicated, that our researches are carried much farther for remedies than the vegetable world, so that we are now obliged to unbowel the earth for minerals, without which we cannot compleat a cure, when the Lues Veneræ has come to the highest degree of the disorder.

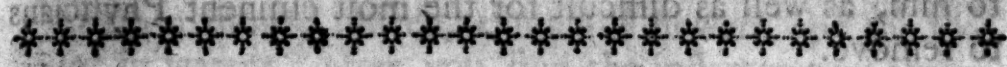
This exhibits the symptoms of its different degrees and stages, being chiefly calculated for persons afflicted with the above-mentioned disorder; with a description of a Medicine, discovered by the Author, which will prove an effectual cure, *ab ovo usque ad malum*. By way of premising, let us treat of a light Gonorrhœa, or Clap.

SECT.

In the early days of Antiquity, the supply was little wanted, men, guided by the laws of temperance, lived till nature, quite exhausted, dropt unperceived into the silent grave. Their simplicity required no physical alleviations, and exercise was their cathartic. But no sooner had luxury and intemperance appeared, than man sadly complained and



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S E C T. I.
Of a Gonorrhœa, or Clap.

WHEN the patient is first afflicted with a Gonorrhœa, or Clap, he is generally seized with a pain in the genitals, succeeded by a running of pus, which, like the semen, issues from the penis: It changes its colourey degrees, and at length arriving to a state of virulency, which is known by its viscid hue, and, finally, amounts to a corrupted matter, mixed with blood, in Latin called Sanies. The preputium very often is contracted over the nut of the penis, and is frequently productive of ulcers, which, in process of time, grow callous.—The cure of them will be mentioned hereafter.

The glans of some are seldom contracted as above-mentioned, of course it is less obnoxious to catch the infection; for, by frequent friction, the nut of the penis is fouled, and the subsequent friction with the linen, cleans it from imbibing the virulent matter after coition. When the infection takes place, a severe smarting succeeds, whenever the patient

tient evacuate his urine, so that the *Ductus Urethræ* seems as insensibly unaccounted for, though sensibly felt, as if it was scalded with hot water.

The next symptom is most probably a contraction of the *Frænum*, or bridle of the *Prepuce*; which is disagreeable to the person when in bed (at that time an erection generally comes on) it often happens that the *Preputium*, or fore-skin, by a violent retraction, is behind the *Glans Penis*; which contraction of the *Frænulum* is called a *Chordee*: In this case the *Glans* are frequently tumified, inflamed, and painful, and often require a chirurgical operation.

When the acrimonious pus runs to excess, it causes a spongy substance to supply the deficiency, which increases progressively, and forms caruncles, and obstructs the urinary passage to such a degree, that the patient cannot discharge his urine *freely*; which, of course, is excessively troublesome to him, as well as difficult for the most eminent Physicians to remove.

Astringents, improperly applied, cause the *Sanies*, that should have been carried off by the *Gonorrhœa*, to settle in the *Scrotum*, which inflames the *Testicles*, and brings on a tumor, attended with excruciating pains; so that the too frequent use of sudorifics, and astringent medicines, excite buboes, tumors, caruncles, carnosities, &c. which are finally attended with the consequence of a *confirmed Pox*; a case too often known, and severely felt, by those whose misfortune it is to be treated by such persons, who are entirely ignorant of the nature of the disorder. (This retraction of the *Prepuce* behind the *Glans*, is called a *Paraphimosis*.) By this means, in not eradicating it from the parts affected, they exsiccate and exhaust the *Virus*, and convey it through other channels into the blood, instead of forcing it out the same way it first entered.

This is left entirely to the judicious Reader, whether he has not heard of those, who have been so mal-treated, and finally fallen victims to the ignorance of those medical impostors. When any person is infected with the minutest taint of the disease, no part of the body can properly be said to be secure.

The

The Female Sex are not troubled with so many different symptoms of the disorder as men are; their complaints are a difficulty in urinary evacuations, and a matter flowing from the parts affected, attended with venereal ulcers and warts, in the internal and external side of the Labia Pudendi: They are likewise with tumors in the groin, commonly called buboes.

I shall proceed in considering the means of cure of the external disorders, which have been before-mentioned.

S E C T. II.

The Cure of a Phimosis.

WHEN the part is first inflamed, foment it with an emollient decoction, four or five times a day, made of marsh-mallows, linseed, camomile flowers, and the like, boiled in water: * after you find the inflammation abated, and cannot immediately retract the Prepuce, as ulcers may be lodged on the nut of the Penis, procure an ivory syringe, with a long and small tube, and *tincture of myrrh*, 2 ounces; to which add of *camphire* two drachms, and with the syringe apply the *tincture* warm between the Prepuce and nut of the Penis twice a day. After you can draw the fore-skin back, dress the ulcers with lint, dipped in the same preparation once a day, as the ulcers tend more or less to a gangrene; by applying what I have here prescribed, you may depend on a compleat cure, by the internal use of my MEDICINE at the same time (called GUTTA SALUTARIS.) Some Gentlemen of the Faculty, in lieu of acting as before-mentioned, generally apply the Mercurial, or Blue Unction, which I can by no means *subscribe* to. — My reasons are as follow, viz. By causing a discharge from the ulcers, by emollient and detergent applications not of Mercury, it will promote the cure much looner; therefore every mercurial application, whether ointment or not, will only make the disease subside for a time, or force it to the Axillary Glands, and some-

* Note, go to any Chymist, or Druggist, and ask for three or four penny-worth of herbs for a Fomentation, you will have them without any further trouble.

sometimes into the bones, which is the efficient cause of those unaccountable pains they generally experience in different parts of their limbs. Notwithstanding this, there is nothing more common than dressing the ulcers with Mercurials. Indeed, I do not pretend to say, but that in my former practice I have acted on similar principles; but from the many experiments I have been obliged to make, on objects discharged from the Hospitals as Incurables, I have been enabled to perform a cure, when the disorder has been in its highest stage, the Vital Spirits almost exhausted; nothing remaining but hope; but by as quick and easy a method as the disorder could admit of, without any confinement whatever; though the quacks (*ex futore Medicus*) who infest the Metropolis, affect to do it without restraint of diet. I entirely disallow it, being convinced an alimentary regimen is highly essential. I shall now proceed to analyze the distemper, according to its different symptoms, stages, causes and effects.

S E C T. III.

Of a contraction of the Frænum, or bridle of the Penis, vulgarly stiled a Chordee.

A CHORDEE is a convulsive contraction of the Frænum, or bridle of the Penis, caused by the corrosive matter affecting them. If the Chordee is not checked in time, it will increase, and will be more difficult to remove.

—*Sero Medicina paratur, cum Mala perlongas invaluere Moras.*

When the patient is afflicted with this disorder, he should avoid excessive exercise, and every thing irritating and sudorific. To remove the contraction, or Chordee, let him plunge his Penis into cold water, five or six times a day, and if that does not take effect, he must then prepare of Turpeth Mineral, six grains and a half, and make it into a pill with conserve of hips, and take it about six in the evening; and when it excites a tendency to vomiting, work it off the same way as any other vomit. If it should not operate in the space of an hour, take twelve or fifteen grains of Ipecacuan, to promote the operation. Eight days after repeat the pill again, as before directed, which will effect a cure.

S E C T.

S E C T. IV.

Of a Paraphimosis, and the Method of Cure.

A PARAPHIMOSIS is a retraction of the Prepuce, or fore-skin behind the Glans Penis, frequently causing pain. The cure depends on the application of emollient decoctions, as is directed for a Phimosis; but you must endeavour, with your finger and thumb, to draw the skin down over the nut, if there is a possibility; but sometimes it requires chirurgical operation, which is by making five or six incisions on the Prepuce with a lancet, to let out the corrupted Sanies there lodged.

S E C T. V.

Of a Priapism, or Chordee.

A PRIAPISM is an involuntary erection, occasioned either by natural lust, or stimulating effect of the Lues Venerea. It of course is very painful, and as it is unnatural, owing to the preposterous tension of the Virga, or Penis, as if in natural or real action, it is generally the result of a violent Gonorrhœa and Chordee. This must be treated just in the same manner as the Chordee before-mentioned, as it is of the same nature.

S E C T. VI.

Of SHANKERS.

A SHANKER is in its nature local, though the consequential symptoms of a confirmed Pox, when it has insinuated itself into the vital system, and Animal Oeconomy. It makes its appearance on the Glans Penis, and by the virulence of the contagion, and the unavoidable friction, which in the common course of things ensues, is exasperated and aggravated to a dilaceration. This species of the Lues Venerea, is sometimes attempted to be cured by caustics, which, in instances of a hale constitution, sometimes operate effectually

fectually, and in weaker, exsiccate and exhaust the radical moisture, so highly essential to promote the grand end of propagation, the continuance of the human species. In this case, I would recommend a strict regimen, mild and simple, with regard to solids; and a detergent and diuretic, in respect to liquids.

I have known Shankers acquired not by coition with an unclean female, but by an excoriation, or strain, or laceration in the act; when the Aditus Vaginæ is too narrow, and the Penis too dense for the passage.

For example: I knew a young Gentleman, who was particularly cautious in his amorous pursuits, who contracted a species of the shanker, viz. a hole in the Glans, attended with acute pain, owing to the acrid quality of urine, in its descent on the excoriated parts.

I knew another whose Prepuce being unnaturally drawn over, and adhering to the Glans Penis, brought on a viscid, glutinous, and virid matter, which (as he was conscientiously innocent of an illicit intercourse with the fair sex) I did not, at first, know what to attribute to: At last, however, he confessed, that being a stranger to copulation, he had found the urinary duct obstructed by a viscid humour, which, in process of time, conglomerated, and by its peculiar malignancy, brought on ulcers, or shankers.

The third instance I knew of these miscalled shankers, is that of a young man, who was formerly addicted much to Onanism; by frequent friction he so debilitated the virile parts, that they proceeded to an uncommon lassitude, and from the adhæsiveness of the Prepuce of the Glans Penis, brought on a medical coalition, which terminated in ulcers, much the same as those called shankers.

The C U R E.

When you are afflicted with a true shanker, from a Venereal complaint, let it be dressed once a day, with honey and egyptiacum, on a little lint. If it is an ulcer, or rather a spurious shanker, dress it morning and evening, with lint dipt into tincture of Myrrh and Camphire, as before directed, for ulcers on the Glans Penis.

S E C T. VII.

Of Inflammations and Tumefactions in the Testicles.

THIS species of the Lues Venerea is particularly painful; it derives its origin from a violent motion, the unseasonable application of Astringents, or neglect of purgatives, &c. In this case bleed proportionably to the appearance of the symptoms, and the strength of your constitution; and apply the fomentation as directed in the prescription for a Phimosis. After you have done this, if any tumour remain, take an ounce and half of Glauber's Salts, and repeat it the third day: And apply a plaister of Hemlock, with Amoniac, which is to be renewed occasionally, till the swelling subsides. Perhaps by rubbing once a day, a little Mercurial, or blue-ointment, into the testicles, and keeping them well trussed up, you may effect a cure. You must, however, remember to have them constantly very tightly trussed up, from the first stage of the disorder, to the completion of the cure.

But if the fomentation, ointment, &c. do not prove efficacious, it will be proper to take six grains and half of Turpeth. Mineral. made into a pill, with any conserve; and when it begins to operate, work it off as another vomit; and if it should not begin to work you, in an hour's time, take fifteen grains of Ipecacuana, in order to force its operation.

S E C T. VIII.

Of B U B O E S.

VENEREAL Buboës are tumors in the groin, arising from a collection of undigested matter, and stagnation of the fluids; when they are soft and flaccid, to a degree of suppuration, it is a favourable and auspicious omen to the patient; and when they do not ripen, it prognosticates the danger of a confirmed pox.

The Method of Cure.

When the swelling first appears, accompanied with a hardness bordering on callosity, and acute pain, take of the strong Mercurial Unguent, and every evening rub to the size of a nutmeg into the part affected; and if it arrives to a state of suppuration, it must be opened with a lancet, and the corrupt matter squeezed out; then make a topical application of yellow basilicon, where a sufficient quantity of red precipitate powder is mixed: *To every ounce of basilicon, add half a drachm of red precipitate powder; let them be well blended together on a marble slab, or in a marble mortar; and when it is spread on as much fine tow as is sufficient for the orifice, tent it with this preparation every morning, and before every dressing wash the wound with a little warm tincture of Myrrh. If there is any appearance of foul flesh, you must touch the part affected with Roman Vitriol.*

I hope these directions, properly observed, will be sufficient to procure and effect a complete cure (if the patient follows them accurately and implicitly) of the local and external disorders, which they are liable to fall victims to. Therefore, without the conceit of egotism, I humbly presume to offer a few instructions, with respect to taking my GUTTA SALUTARIS, not improperly called, *The Drop of Health*, as likewise to give you some account of its efficacy.

It is morally impossible to offer any discovery or improvement to the public, in the medical art, without some vague censures from those whose interests and inclinations end in selfish prejudices.

The medicine I am now treating of, is of my own invention, composition, and preparation; a certain and infallible remedy for the Venereal Disease in all its different stages. It removes pains in the bones, and exhilarates and invigorates the aged and infirm.

As the proprietor and inventor of this preparation being confident of its success, he waves all self encomiums, leaving its own praise to its intrinsic merit, and happy effects; though I thought it necessary, *pro bono publico*, to notify some of its essential qualities.

This medicine is founded on the most rational principles;
it

it acts on the constitution as an alterative, therefore, common sense must convince every reasonable person, that a remedy, calculated on these principles, cannot fail to effect a complete cure, even if the blood and juices be tainted with a scorbutic, scrophulous, or cancerous quality, and may be authenticated as a genuine specific, by the testimony of some hundreds in these kingdoms, as likewise the colonies.

The method of taking this medicine for a Gonorrhœa, or Clap, is as follows, viz.

The dose is a tea spoonful, four times a day, in a glass of cold water; to the last dose you take, add as much salt of Nitre as will lay on a six-pence, and fifteen drops of the Balsam Capiva: These two articles you can buy at any Chemist's shop, at a very reasonable rate. Ask for an ounce of Salt of Nitre, which will cost two-pence; and ask for an ounce of Balsam Capiva, which will only cost six-pence; and apply as before directed, and in about fifteen or twenty days, you will get a sound cure.

Please to shake the bottle every time you take it for a confirmed pox, accompanied with violent pains in the bones, or elsewhere.

If used as under-mentioned, it will absolutely carry off fits of the gout, if ever so violent.

A Decoction for a Confirmed Pox.

Apply to a Chemist, and buy half a pound of the best Sarsaparilla, and as much of the Burdock Root; let the Burdock Root be well washed and sliced; then take four ounces of Sarsaparilla, and four ounces of the Burdock Root, and put them into two gallons of river water, and boil them until two quarts are evaporated, then strain it, and sweeten it for use.

The GUTTA SALUTARIS must be taken a tea-spoonful in a wine glass of cold water, four times a day, as before directed, only leaving out the Nitre and Balsam Capiva; instead of which you must drink half a pint of the above decoction every morning, noon, and night, until it intirely eradicates the disorder, which will be in about five or six weeks, without any confinement; though I do not advise the patient
to

to go into the wet, during the time he is under cure, for if he should take a cold, it will be a means of putting a stop to the cure, by bringing on other disorders, &c.

N. B. You must continue taking this medicine until you find every symptom of the disorder entirely abated.

I have administered this medicine with universal success for fifteen years past, in Africa, America, and the West-India Islands, from whence the disease originally proceeded.*

I have likewise, for these eight years past, administered it with the most flattering success in Europe, in many branches of which disorder (in private practice) its restorative qualities have been happily experienced; and at the request of those who have experienced its good effects, I am now induced to publish it, for the benefit of human kind, and can assure the afflicted, that there is not a grain of Mercury in its preparation; but to be candid, it is a Chymical preparation of Antimony.

S E C T. IX.

Of a confirmed Pox.

I SHALL not, as some of my predecessors have done, spend time and paper in investigating the origin of this baneful distemper, as it must consist of, at least, vague and precarious conjectures, however ingenious and plausible they may appear in the perusal. Suffice it is to say, that I think it not a temporary, or accidental disease, but co-eval almost with the world itself; as it appears in so many different symptoms, stages, modes, forms and effects: Mankind (notwithstanding that *Laudator Temporis acti*, talks of the degeneracy of the present times) has been, is, and will be, in form, substance, and nature, nearly the same.

Its locality may be demonstrated by daily experience, as it sometimes does not attack the whole vital spirits, but flies to the weaker parts, and settles in them according to the human constitution. It may be caught without a previous clap, or Gonorrhœa, by a connection with a person afflicted with

* The disorder was first brought into Europe in the year 1493, and was never heard of before that time.

with it in its confirmed, and most virulent state. Again, it may arrive progressively, from a simple clap or Gonorrhœa, by the patient's delay in making application for a cure, ill and imprudent treatment of it, or not observing a proper regimen or diet, during the process of the cure.

Though I have had it properly attested, by credible patients and witnesses (and do not doubt the possibility of it) that a Gonorrhœa, or simple clap, will run itself off, yet (not from self-interested motives I speak) I would not advise any one to trust to such a precarious chance, especially if the person afflicted is of a weak and tender constitution.

I cannot admit with some authors in London, who positively deny that Mercury and Antimony are of no use in the Lues Venerea; but I must beg leave to differ from all such practitioners, for in some difficult cases, it is indispensable; as the Virus frequently lodges, and insinuates itself into the excretory glands, and can only be carried off by the use of Mercury or Antimony properly prepared. As an instance of the abuse of Mercurials, I shall quote a case mentioned by Dr. Smyth, in his elaborate treatise on this disorder.

“ A Gentleman of fortune, who had, in his juvenile days, contracted the Venereal infection, and had reason to imagine he had been unskilfully treated, and that the poison still remained lurking in his blood, sent for a famous Empyric, who, with a boasted nostrum made his appearance within these few years: The Gentleman explained his case, and asked this genius if he could relieve him without the assistance of Mercury, having been sufficiently tortured with that unmerciful Mineral already. To this he answered in the affirmative; upon which the Gentleman consented, and the cure immediately proceeded on, which was managed with such dexterity, that the patient was in a salivation in a few days. Not a little exasperated, at finding himself deceived, and in such a situation, he sent for the wonder of the age, who declared there was not a single particle of Mercury in any of his medicines, but that they were expelling the Mercurials that had formerly been taken.—Wonderfully, indeed, must be the remedy, that in a few days will carry off, by the salival Glands, the relics of Mercury that had been there for years, and probably baffled the endeavours of every rational means! But
what

what was this famous composition, that had this singular effect? Seven grains of *Mercurius dulcis*; or sweet Mercury, mixed with a little conserve of roses, in the form of a bolus; and given every other night, until the patient was brought into the state mentioned. This story was told me by a person of veracity, who prepared the medicines according to the quack's directions."

Having troubled the reader with this epistle, I shall now proceed relative to the symptoms of a confirmed pox, viz. The symptoms of a confirmed pox, are tormenting pains in the head, joints of the shoulders, arms, legs, and in most other parts of the bones, and buboes in the groin; these constitute the first degree of this cruel disorder; and without an immediate remedy, various parts of the body and head, are sorely afflicted with scabs and scurf; and when it come to the greatest height of this loathsome disease, the pains become more intense, and the afflicted is so very much tortured, that he can by no means bear to lie in bed.

Soon after those pains, scurf, &c. appear, there then follow Phagedenic ulcers, which generally begin in the throat, and gradually creep by the palate to the cartilage of the nose, which is soon destroyed, and the nose drops down flat: So that one thing following another, the patient becomes a victim to the disorder, and being no longer able to struggle, with stench, rottenness, and the loss of one member after another, his offensive carcass is hurried under-ground, and perhaps without the least pity from any acquaintance whatever.

Other symptoms of the disorder are, the skin is covered with spots like freckles, of a yellow or livid colour, chaps in the palms of the hands and soles of the feet, with a severe itching, from whence proceeds a clear serous liquor, and the skin peels off in large flakes; sometimes there appear hard, callous, pustules, that are scaly, branny, and oftentimes moist; frequently the corners of the lips, sides of the nostrils, forehead, temples, and behind the ears, are affected with the like, as also betwixt the hairs of the head, so that the hair falls off, the nails become thick, wrinkled, and uneven; soon after, ulcers arise, which destroy the nails, &c.

The teeth-ach, the gums are covered with ulcers, and the breath is very offensive; in short, when any person is thus afflicted,

afflicted he is a burthen to himself, and a pest to the community in general.

Therefore, in order to keep from the censure and lash of the world, my advice to those who stand in need of it is, for them to endeavour and get a cure without delay, to set a firm resolution and take the medicine in a very regular manner, and not to try this, that, and the other, which is too often the case with a number of people, and that to the great prejudice of their pockets, and constitutions.

I shall conclude this prefatory and concise account of a confirmed pox, or highest stage of the Venereal Disease, with this Anecdote, as I intend this a meer Venereal Vade Mecum, or every person (afflicted with that disorder) his own Physician.

Many people are deterred from reading a treatise of this kind, from a two-fold motive, its prolixity, and the expence of purchasing; for which reason I was determined to be as concise, and consequently as cheap as possible.

If I have attained this end, I shall be happy in gratifying the reader's curiosity, and administering some relief to the afflicted. And beg leave to end, with publishing the two following extraordinary cures, the one sworn to before Justice Goodchild, at Charing-Cross; and the other sworn before the Right Hon. the Lord Mayor of the city of London.

The Case of DAVID MURRAY, Esq.

To Doctor FREEMAN.

SIR,

FOR the universal good of mankind, that may labour under the same disorder that I have done, do make oath, that I DAVID MURRAY, (an Officer, by Commission, in the army) was very severely afflicted with a most inveterate Venereal Disorder, and had been under the hands of Gentlemen of the Faculty, endeavouring to get cured, but to no effect, for the longer they practised on me, the worse I grew, so that at last my face was changed to the colour of a Mulatto, and the head of my Penis swelled, and so much inflamed.

flamed, that it would measure full four inches diameter; but by taking four small bottles of your **GUTTA SALUTARIS**, it made an excessive fine cure (and that in about six weeks time) I therefore think that every Gentleman, who receives the benefit that I have done from so valuable a Medicine, need not be ashamed to let the public know its efficacy, which I pray the favour of you to do for me. Witness my hand, this 20th day of June, **DAVID MURRAY.**
Ensign of late 76th Regiment.

Westminster, } Sworn before me, the day above written,
To wit. }
(COPY) **JOHN GOODCHILD.**

The following is a recent cure of a man who had applied to the Hospitals and Faculty for seven or eight months, and could not get relieved, until he took the **GUTTA SALUTARIS**, viz.

To Doctor **FREEMAN.**

S I R,

IN gratitude to you, and in justice to your Medicine, do solemnly swear, before the Right Hon. the Lord Mayor of the City of London, that I was afflicted with a most inveterate Venereal Disorder, which caused an excrescence of flesh to grow on my lower jaw, as large as a goose's egg, which was very troublesome to me; and after I had applied to the Faculty and Hospitals, for seven or eight months, got no relief; but by taking your Medicine called **GUTTA SALUTARIS**, am now effectually cured of the disorder; also the lump that grew on my face is intirely eradicated, to the great surprise of many of my friends: Therefore hope you will publish this my affidavit (of so great a cure) for the benefit of my fellow creatures in general, who may unfortunately labour under the same disorder. Witness my hand, this 22d of September, 1772. **ROBERT MALCOM,**

Peter-Street, Westminster.

Sworn before me, at the Mansion-House, }
the day above written, } (COPY)

WILLIAM NASH, Mayor.



The Design of the following Discourse of ANATOMY, is intended to please the Curious Reader, who delight in searching after hidden Mystery, as also to exhibit the great abilities of those Learned and Accurate Anatomists who has made it their study to enlighten the understanding of mankind in general; the Names of which are quoted through the whole Work.

S E C T. XI.

Of the Stones or Testicles.

THE Stones in Latin are called Testes, either because they testify one to be a man, or because amongst the Romans none were admitted to bear witness but he that had them. In Greek they are called Medea kuamoi and also didumoi twins, because, according to Nature, they are always two.

They hang without the abdomen, at the root of the yard, in the cod or scrotum. Their figure is oval, only a little flattish. Their bigness differs very much in several persons; as big as dove's egg is reckoned a mean size. Hippocrates held the right to be bigger and hotter than the left, and therefore called it arregonos the male-getter, as the left thelegonos the female-begetter. But these are fancies that are obsolete, and indeed seem ridiculous, seeing there is no such difference of their bigness, and that their vessels are common.

As for nerves, Doctor Willis says, he could never observe more to go to them than one from a vertebral pair, and that too was most of it spent upon the muscle Cremaster. Die-

merbroeck agrees to one nerve, but thinks it proceeds from the sixth pair. Concerning the use of these nerves, there is a great controversy: Doctor Glisson, Wharton, &c. will have them to convey a succus genitilis, which makes the greatest part of the seed. Dr. Willis, as he denies (in *Cerebri Anatomie*, cap. 27.) any succus nutritius to be conveyed by the nerves to other parts; so, that any succus genitilis is brought by them hither, but only animal spirit. And whereas, to strengthen the former opinion, 'tis usually objected, that the seed must needs consist of a nervous juice and plenty of spirits brought from the brain, because of the great debility and enervation that is induced upon the brain and nerves by the too great expence of it: he thus answers, That this comes to pass, because after great profusions of seed, for the restoration of the same humour (whereof nature is more solicitous than for the benefit of the individual) a greater tribute of spirituous liquor is required from the blood to be bestowed on the testicles: wherefore the brain being defrauded of a due income, and afflux of the said spirituous liquor, languishes; and so the animal spirits failing in the fountain, the whole nervous system becomes depauperated and flaggy. Whereto may be added, that also the animal spirits themselves that actuate the Prostates, being derived from the spinal marrow, are much wasted by venereal acts; so that for this reason besides, the loins are enervated. In this answer Bartholin acquiesces.

I shall now proceed to give an exact definition of the Penis.

Of the Penis or Yard, shewing the Act of Generation.

The seed being elaborated and treasured up in the organs of generation, there was need of a peculiar instrument whereby it might be conveyed into the womb of the female; and to this purpose nature has furnished the male with a yard, which we now come to anatomize.

It is called in Latin Penis, a Pendendo, because it hangeth without the belly. Also Virga, Membrum virile, Veretrum, Mentula, and by many other names invented by lustful persons, and lascivious poets.

It is an organical part, long and round, yet somewhat flat

on

on the upper side, seated under the ossa pubis; appointed partly for making of water, but principally for conveying the seed into the matrix.

As to its thickness or length, it differs much in divers men. But it is generally observed to be larger in short men, and such as are not much given to venery; also those that have high and long noses, and are stupid and half-witted.

It is neither bony, as in a dog, fox, wolf; nor gristly nor fleshy; but is framed of a peculiar substance, such as might most conveniently admit of distention and relaxation.

It hath no fat, for first that would have hindered its erection into that stiffness which is necessary; and secondly, would have occasioned it to grow too bulky; and lastly, would have dulled that great pleasure that in venery the male is affected with in this part.

The proper parts are the two nervous bodies, the septum, the urethra, four muscles, the glands, the præputium, two ligaments, and the vessels.

The nervous bodies (called by Mr. Cowper, corpora cavernosa) are two oblong capsulæ or cases, encompassed with a thick, white, nervous, and very firm membrane, (like an artery) but their inner substance is spongy, being mostly a contexture of veins, arteries, and nervous fibres, woven one into another like a net.

They spring from the lower side of the ossa pubis at distinct originals, where they appear like two horns, (called by some crura) or are of a figure resembling the letter Y, that the urethra may have room to pass between them. When they leave the ossa pubis, they are each covered with a several membrane, and are afterwards joined together with only the septum between, which the nearer it comes towards the glans, is the thinner, so that before it come to the middle of the penis, its fibres extend towards the back of the yard from the urethra in order like unto a weaver's flay, and while it still goes further, its fibres by degrees grow so very small, that near the glans the septum is almost obliterated, and the two nervous bodies seem to grow into one.

Whence it is that the penis is equally erected; for if the septum had exactly distinguished one part from the other, it might sometimes have so happened by the compression of the

arteries

arteries of the one or the other side, that one part of it would have been extended, and the other remained flabby.

Doctor Wharton affirms, these nervous bodies have glandulous flesh within them, which keeps the yard something plump, even when it is not erect. But de Graef denies this, and demonstrates that they have no other substance than before said. Let the yard be prepared thus: First gently squeeze the blood out of it, which it always has in greater or lesser plenty, and then put a little tube into the spongy substance, namely in at the end which is next to the ossa pubis; and let the cavity of the penis be half filled with water by the help of a syringe, and shake the penis with the water in it, pour out that bloody water, and fill it again with clear, and so three or four times, till the water is no longer stained with blood. Then 'twixt two linen cloths squeeze out what water is in the nervous bodies, and at length blow up the penis so long till it have its natural bigness; in which posture, if you will keep it, you must tie it hard. When the penis is thus distended and dried, you may examine it as you please, and will find no other substance.

Mr. Cowper says, there is great analogy between the internal structure of this and that of the spleen; in both which the veins have large apertures or cells, which most plainly appear in the bulbus of a dog's penis, as he calls the upper part of the urethra that lies between the crura of the nervous bodies.

Below these nervous bodies lies the urethra, being of a much like substance to them, saving that its spongy part, which is outer and lower, hath less pores, because of its smaller and more plentiful fibres. This part does tumify whenever the nervous bodies do.

Its inner part is membranous, round & hollow, and exceeding sensible. It is of an equal width from one end to the other, save in its fore-part, where the glans are joined to the nervous bodies, for there it hath a small cavern, into which the acrimonious urine lighting in the stone of the bladder, while it wheels about in it, causeth pain, and is a great sign of the stone. Sometimes also the acrimonious eroding liquor in a Gonorrhoe staying there, doth cause a most tormenting ulceration.

It is continuous to the neck of the bladder, but has not
its

its rise from it, nor is of the same kind of substance. If you boil the bladder, and it, it will easily separate, and appears of a clear other substance and colour. It begins at the neck of the bladder and reaches to the end of the glans, which it seems to bestow a membrane upon, from its own inner one, for it is plainly continued from it.

Its use is to convey along the seed and urine. And to that end there open into it small pores that transmit the seed into it, from the necks of the *vesiculæ seminales*, and pours out the urine into it.

The muscles are two on each side, and so four in all. Of these one pair are called by some *colateral muscles*, by others *erectores*. These are shorter and thicker, and spring from the appendix or external knob of the *coxendix*, under the beginning of the nervous bodies, and are inserted into their thick investing membrane, a little from their beginning. These serve for erection of the Penis.

The second pair is longer and smaller, proceeding from the sphincter of the anus. These pass straight by the sides of the urethra, and are inserted into it about its middle; they serve to dilate it for miction and ejaculation of the seed, and are called *Dilatantes*, *wideners*, and *Acceleratores*, *hasteners*.

These have been held to be the uses of these muscles, but *de Graef* assigns a clear contrary use to them, and that with great reason, for seeing the action of a muscle is contraction, how should the former pair extend the penis, and not rather draw it back towards their original? or how should the latter serve to dilate the urethra, and not straiten it, seeing in the action or contraction of a muscle its belly or middle swells. Therefore, he says, that the muscles only contribute thus far, or in this respect, to the extension or erection of the penis, in as much as by their swelling (partly by blood and spirit flowing into them, partly by their proper action) they serve to straiten and compress the roots of the nervous bodies and the spongy part of the urethra, and so drive the blood that flows in by the arteries towards the glans, and hinder its returning back again by the veins: a resemblance whereof may be exhibited by a piece of a gut, which, if we fill with wind or water, and then compress that end by which they entered, (the other being tyed) we shall see the other rise out and be more distended.

Mr.

Mr. Cowper will not have the intumescence of the bellies of these muscles to be the principal cause of erection; but explains it thus: The penis is approximated (he says) to the ossa pubis.

When these muscles act, by means of the ligamentum suspensorium (bye and bye to be described) whereby the blood is not only driven forwards towards the glans in greater plenty, and its veins distended, but their great trunks running over the dorsum penis, are compressed under the ligamentum transversum of the ossa pubis. The like cannot happen in the cavernous body of the urethra, since there is no bone whose position can have that effect upon its veins, as the ossa pubis have upon the penis itself. Wherefore the muscoli acceleratores compressing its veins do that office.

Whence it happens, in an imperfect erection, the glans are not equally extended with the penis itself, and at other times are soonest relaxt. — The blood, thus hindered in its return, distends the corpora nervosa and urethra, which are thereby erected.

The end or head of the penis is called glans and balanus. Into this the nervous bodies terminate; and being a little thicker (on that side next them) than they, it forms a kind of a circle; on its fore-part it is smaller and sharper. It has a peculiar substance (Dr. Wharton says glandulous) soft and spongy, and being covered with a very thin membrane, produced from the internal one of the urethra (which coming out of its hollow, dilates itself so as to cover all the glans) it thereby, and from its proper substance much interwoven with nerves, becomes most exquisitely sensible, and is the principal seat of pleasure in copulation. Which if it had not been very great, who would have taken delight in so brutish a thing as venery? as Andreas Laurentius elegantly expostulates, (Anat. lib. 7. cap. 1. q. 7.)

“ Who (most strange!) would have solicited or accepted
 “ of so vile and filthy a thing as lying with a woman? With
 “ what face would man, that divine animal, full of reason and
 “ counsel, have handled the obscene parts of woman polluted
 “ with so much filth, which is discharged into this low place,
 “ as into the common sink of the body? On the other side,
 “ what woman would have accepted of the embraces of a
 “ man,

“ man, considering the toil and tediousness of going nine
 “ months with child, the most painful and often fatal bear-
 “ ing it, and its education full of care and anxiety, unless
 “ the genitals had been affected in the act of coition with
 “ transporting pleasure?”

Some take the glans to be only a continuation of the corpora nervosa, and not of a substance distinct from them.

The glans are covered with the preputium, or fore-skin, which is framed of the reduplication of the skin.

It is called *præputium*, because it is placed *præputendo*, before the yard : or rather a *præputando*, from being cut off ; for this is the part which the Jews cut off in circumcision, from whence they are called *apellæ* and *recutiti*. And it is reported from divers persons, by their own inspection, that in Jewish children it is six times as large as in Christians, and hangs a great way over the glans before it is cut off.

In that part where the prepuce is contiguous to the glans, Doctor Tyson (as reported by Mr. Cowper) has discovered certain small glands ; which, from the great scent their separate liquor emits, he calls *glandulæ odoriferæ*. They are very conspicuous in most quadrupeds, particularly in dogs and boars, in the latter of which their separated liquor is contained in a proper cyst, at a verge of the prepuce, out of which there is a large aperture, whereby 'tis remitted again to lubricate the Penis.

The præpuce is tyed to the lower side of the glans by a ligament, called *frænum*, or bridle. This in some is so short, that 'tis necessary to cut it, to procure a compleat erection.

Besides this ligament, I cannot but mention another, first (I think) observed by the ingenious Mr. Cowper, which (from its use) he calls *ligamentum suspensorium*. It arises, he says, from the fore-part of the *ossa pubis*, and is fixt to the *dorsum penis*, on each side the great vein that runs along it.

Some of the vessels are cutaneous, some pass to the inner parts of the penis.

The cutaneous arteries arise from the external branch of the iliack, and running from the root of the yard towards and along its back, divide themselves into many branches. They are called *pudendæ*, from the parts they minister to us ; as are also the veins, which spring from the exterior iliack,

and keep the same course with the arteries that are bestowed on the inner parts of the penis, spring from the inner (hypogastric) branch of the iliack; and after they have sent twigs to the muscles of the penis just at the meeting of the two nervous bodies, through whose length they run and are mostly dispersed in them, and in the fungous part of the urethræ, sending forth little twigs at the sides.

It has two nerves from the lowest vertebral, the greater of them, that is very large and long, is distributed into the nervous bodies, urethra and glans; the lesser is bestowed upon its muscles: Concerning which Doctor Willis thus discourses,

“ This member (saith he) having only nerves from the
 “ spinal marrow, should only have a spontaneous motion,
 “ according to our hypothesis, (viz. that the nerves from the
 “ brain serve for natural, and the vertebral for voluntary
 “ motion,) and yet through the turgescency of the genital
 “ humour, it is often erected and filled with spirit against
 “ one’s mind; which is from hence, because from this verte-
 “ bral pair whence the nerves of the penis spring, a sprig is
 “ reached forth to the vertebral pair next above it; viz. to
 “ that in which is radicated the plexus; also a notable nerve
 “ is implanted from the intercostal pair. Seeing therefore
 “ there is a communication between the prostatæ (which de-
 “ pend much on the intercostal nerves and the penis itself, by
 “ reason of the insertion of the aforesaid sprig into the plexus,
 “ from whence the prostatæ have these nerves) hence it comes
 “ to pass that it acts accordingly as they are affected. But
 “ they (viz. the prostates) are not only apt to be moved
 “ by the turgescency of the seed, but by the communication
 “ of the intercostal nerve, according to the impressions made
 “ on the senses or brain, are wont to be irritated by too im-
 “ portune an action, into consent wherewith the penis is pre-
 “ sently excited.”

Mr. Cowper has observed lympheducts in this part running under the common integuments, accompanying the cutaneous veins, and emptying into the glandulæ inguinales. Which, says he, may serve to inform us, how the morbid matter comes to be conveyed more particularly to those glands in venereal cases, and cause those tumours that frequently happen in the groin on that occasion, (commonly called buboes.)

Its

Its principal use is to convey the seed into the uterus of the female; and its use to piss withal, is but secondary, for many creatures (as fowls in general) make no water by it, yet have a penis for the use aforesaid.

The part that is next above it, towards the belly, is called the pubes; and its lateral parts are called inguina, the groins.

S E C T. XII.

Having done with the parts ministering to generation in Men, I shall next proceed to those in Women.

IN describing of those parts it has been the method of divers anatomists to begin first with the outer parts of the privy: but because I would observe, as much as possible, the same order in women as I have in men, I shall first begin with spermatick vessels, which are of two sorts, *Arteries* and *Veins*.

The *Arteries* are two, as in men. They spring from the great artery a little below the emulgents, and pass down towards the testis, not by such a direct course as in men, but with much twirling and winding amongst the veins, with which yet they have no inosculation, as has been generally taught. But for all their winding, when they are stretched out to their full length, they are not so long as those of men; because in them they descend out of the abdomen into the scrotum, but in women they have a far shorter passage, reaching only to the testes and womb within the abdomen.

The *Veins* are also two, arising, as in men, the right from the trunk of the cava, a little below the emulgent, the left from the emulgent itself. In their descent they have no more windings than in men, and therefore are considerably shorter.

Both the arteries and veins as they pass down are covered with one common coat from the peritonæum; and near the testes they are divided into two branches, the upper whereof is planted into the testicle by a triple root; and the other is sub-divided below the testes into three twigs, one of which goes to the bottom of the womb, another to the tuba and round ligament, the third creeping by the sides of the womb

under its common membrane, ends in its neck, where it is interwoven with the hypogastrick vessels, like unto a net. By this way it is that the *Menstrua* sometimes flow in women with child for the first months, and not out of the inner cavity of the uterus: but yet the blood does not flow at that time so much by the spermatick arteries as by the hypogastrick.

The use of those spermatick vessels is to minister to the (generation of seed, according to the ancient doctrine; but) nutrition of the eggs in the ovaria or testes, (according to the new) the nourishment of the foetus, and of the womb itself, and the expurgation of the menses; inasmuch as blood is conveyed by the arteries to all those parts to which their ramifications come, in which parts they leave what is to be separated according to the law of nature, the remaining blood returning by the yeins.

Of Women's Testicles, or Ovaria.

Women's *Testicles* differ much from men's, both in their situation, figure, greatness, coverings, substance and use.

First, their situation is not without the body, as in men, but in the inner cavity of the abdomen, on each side two fingers breadth distance from the bottom of the womb, to whose sides they are knit by the intervention of a strong ligament, that has used to be called the vas deferens.

They are flat on the sides; in their lower part oval, but in their upper, where the blood vessels enter them, more plain. Their superficies is more rugged and unequal than in those of men. They have no epididymides, nor cremaster muscles. They differ in bigness according to age: in those newly come to maturity they are about half as big as those of men; but in those in years they are less and harder. Preternaturally they sometimes grow to a vast bigness from hydropical tumours, in which several quarts of serous liquor have been found to be contained.

They have but one membrane that encompasses them round; but on their upper side, where the vasa præparantia enter them, they are about half way involved in another membrane that accompanies these vessels, and springs from the peritonæum.

When

When this cover is removed, their substance appears whitish, but is wholly different from the substance of men's testicles. For men's (as was said above) are composed of seminary vessels, which being continued to one another, are twenty or thirty ells long, if one could draw them out at length without breaking: but women's do principally consist of a great many membranes & fibres loosely united to one another, amongst which, in the outer superficies of the testes, there are several little bladders like to hydatides, full of clear liquor, through whose membranes the nerves and vasa præparantia run, and are obliterated in them.

The liquor contained in the bladders had always been supposed by the followers of Hypocrates and Galen, to be seed stored up in them, as if they supplied the place of the *visiculæ seminales* in men. But from Dr. Harvey downwards, many learned physicians and anatomists, according to Aristotle, have denied all seed to women. Of which the said Doctor Harvey thus discourses, *De ovi materia*, Exercit. 34. "Some women emit no such humour as is called seed, and yet is not conception thereby necessarily frustrated; for I have known several women (says he) that have been fruitful enough without such emission; yea, some that after they begun to emit such humour, though they took greater pleasure in copulation, yet grew less fruitful than before. There are also infinite instances of women, who though they have pleasure in coition, yet send forth nothing, and notwithstanding conceive." Miror maxime, adds he, eos, qui emissionem hanc ad generationem necessariam putant, non animadvertisse, humorem illum foras ejici, et circa clitoridem vulvæque orificium ut plurimum profundi, raro intra vulvam, nunquam vero intra uterum, ut cum maris spermate misceatur; esseque consistentia serosum sive ichorosum, ad modum urinæ; non autem genituræ instar, lentum atque unctuosum; ut tactu facile innotescit. Quorsum autem foras ejiciatur, cujus usus necessario intus requiritur? Debitne humor ille, ceu utero valedicturus, ad limen vulvæ amandari; ut majore cum gratia ab utero retraheretur denuo? So that both from the place of its emission, and from its consistence, he concludes that the humour emitted cannot be seed. To strengthen which opinion two reasons may be added,
why

why it cannot be the humour contained in the vesiculæ, and consequently that it cannot be seed; first, because it is sent forth in greater quantity than that it can be supplied from them; and secondly, because the vesiculæ are destitute of any such pore or passage whereby the liquor contained in them might issue out; for if you press them never so hard, unless you burst them, there will nothing pass out of them.

We must therefore subscribe to that new but necessary opinion, that supposes these little bladders to contain nothing of seed, but that they are truly eggs, analogous to those of fowls and other creatures; and that the testicles (so called) are not truly so, nor have any such office as those of men, but are indeed an ovarium, wherein these eggs are nourished by the sanguinary vessels dispersed through them, and from whence one or more (as they are fecundated by the man's seed) separate and are conveyed into the womb by the tubæ fallopianæ, which will be hereafter described.

That these vesiculæ are analogous to the little eggs in the ovarium of a fowl, de Graef evinces by this experiment, that if you boil them, their liquor will have the same colour, taste, and consistency with the white of birds eggs. And their difference in wanting shells is of no moment; for even the eggs of fowls, while they are in the ovary, (and after they have descended into the uterus have no shell: and though they have one when laid, it is no ways essential to them, but only a fence that nature has provided (upon their exclusion) to preserve them from external injuries, while they are hatched without the body; whereas those of women, being fostered within their body, have no need of other fence than the womb, by which they are sufficiently defended. Only let it be noted, that besides these ova, there are sometimes other bladders larger than they, which are a sort of hydatides, and whose contained liquor is thinner than that of the ova, and will not coagulate by boiling.

Having compared these vesiculæ to the eggs of fowls, I might here follow the method of Doctor Harvey and de Graef, and describe the ovarium, &c. in hens and other fowls, that from thence these in women might the better be conceived of and apprehended; but to the curious and learned reader I shall recommend the said authors for satisfaction, and

and avoiding all unnecessary and unsuitable excursion, I shall only further note two things: First, that these eggs in women are commonly towards the number of twenty in each testicle or ovarium, of which some are far less than others. And secondly, that the objection of the Galenists against the Aristotelians, (viz. that the testes of females must needs make seed, because when they have been cut out, barrenness always followed) will be sufficiently obviated by this new hypothesis, that agrees to the necessity of the testicles so far as to affirm that the vesiculæ contained in them become (when they are impregnated by the masculine seed) the very conceptions themselves, which therefore it would be in vain to expect if the female were castrated.

And according to Doctor Wharton, besides the vasa præparantia, and nerves, they have also lympheducts.

S E C T. XIII.

Of the Vasa Deferentia in Women, or their Oviducts.

GALEN, with most of the ancients, reckoned those short processes or ligaments that go streight from the testes to the bottom of the womb, to be *vasa deferentia*; and that the seed was emitted from the testes through them into the fundus uteri. And Fernelius, Riolanus, &c. thought they found a small pipe passing on each side out of these processes by the sides of the womb to its neck, into which they were inserted and opened near its orifice. By the former it was supposed women not with child did emit their seed into the bottom of the womb, and by the latter such as were already impregnated: for that, if it should have issued into the fundus where the conception was, it would there have corrupted, to the great prejudice of the foetus.

But as to these latter ducts, Vestingius, Diemerbroeck, de Graef, and many other accurate anatomists, have not been able to find the least foot-step of them. And as for the former, seeing they are not pervious, nor have any cavity, (and therefore can neither contain nor convey any thing of seed) we must conclude with de Graef, that they are only ligaments of the testicles, to keep them in their place; which he evinces

evinces further by observing, that they come not to the inner cavity of the uterus, but are knit only to its outer coat: for he says, there are only two holes in the *fundus uteri* that admit a probe, and those lead to the *tubæ fallopianæ*, and not to these. Seeing therefore that those which have been accounted *vasa deferentia* either are not to be found at all, or are found incapable of such an office; and having withal rejected the opinion of women's having seed, and affirmed, that which makes the conception is one of those vesiculæ in the testes, dropping from thence and conveyed into the womb, we must enquire by what way these can pass.

For if the above-said ligaments (reputed *vasa deferentia*) have no passage whereby even the semen, if there were any, might be conducted; much less could one of these vesiculæ be conveyed that way. And therefore, for the *vasa deferentia* we assign those ducts that Fallopius, in his anatomical observations, calls *tubæ*, & describeth thus: "They are very slender and narrow ducts, nervous and white, arising from the horns (or sides) of the womb, and at a little distance from it they become larger, and twist like the tendrel of a vine, till near their end, where ceasing their winding they grow very large, and seem membranous, and carnous from their red colour, which end is very much torn and jagged like the edge of rent cloaths: and has a large foramen, which (says he) always lies closed, because those jags fall together; but yet being carefully examined, they are like the utmost orifice of a brass trumpet." But de Graef says, though they grow very large towards their end, yet of a sudden the very extream part is narrowed before it is divided into the aforesaid jags, which resembles unto leaves. Who also appeals unto experiment for these *tubæ*'s being pervious; affirming, that if one put a little tube into the beginning of one of these same trumpets and blow it, the wind will presently break through it, which he saith he has observed in all the kinds of animals that he has dissected. "These *tubæ* (according to Doctor Harvey) are the same in women, that the cornua or horns of the womb are in other creatures. For they answer to those both in situation, connexion, amplitude, perforation, likeness, and also office: for as other animals always conceive in the cornua, so it has been sometimes observed that a concep-

tion

tion has in a woman been contained in one of the tubæ." Which must have happened, when the ovum, being received out of the testes into it, has been stop'd in its passage to the womb, either from its own bigness, or some obstruction in the tubæ.

Their substance is not nervous (as Fallopius, in the above-recited description, affirms) but membranous; for they consist of two membranes, the outer and inner: the inner springs from (or at least is common with) the inmost membrane of the womb; but whereas it is smooth in the womb, it is very wrinkled in the tubæ. The outer is common with the outmost of the womb; this is smooth.

The capacity of these ducts varies much; for in the beginning, as it goes out of the womb, it only admits a bristle, but in its progress where it is largest it will receive one's little finger. But in the outmost extremity, where 'tis divided into jags, it is but about a quarter so wide.

They are very uncertain also in their length; for from four to five, they sometimes encrease to eight or nine fingers breadth long.

Their use is in a fruitful copulation to grant a passage to a more subtle part of the masculine seed (or to a seminal air) towards the testes, to bedew the eggs contained in them; which eggs (one or more) being by that means fecundated (or ripened as it were) and dropping off from the testes (in the manner as shall be described hereafter) are received by the extremity of the tubæ, and carried along their inner cavity to the uterus. For Doctor Harvey affirms, that they have a worm-like or peristaltick motion, like that of the guts, (*de cervarum et damarum utero, exercit. 65.*) and the same is affirmed by Swammerdam.

Against this use two objections may be made; first, that the end of the tubæ not adhering close to the testes, when one of the vesiculæ, (or ova, as we think they are) shall drop off from the testes, it would more probably fall into the cavity of the abdomen, than light just pat in the mouth of the tubæ. Secondly, that when it is received by it, its duct is so narrow, that 'tis hard to conceive how it can pass by it.

As to the first; the same objection may lie against the use of the oviduct or infundibulum in hens, for neither in them

does it join quite close to the ovarium, (as Swammerdam, &c. truly observes) and yet it is certain that the vitelli or little yolks (or rudiments of the eggs) do all pass by them to the uterus. The same Swammerdam also observes in frogs, in one of whom there are many hundreds of eggs, which all pass one after another from the ovarium by the oviduct, and is almost two fingers breadth from the ovarium, and besides is immoveable, whereas the tubæ in women are at liberty (and are more than long enough) to embrace the ovarium with their orifice: and we may reasonably believe that they do so when a conception is made; for it is not improbable, that when all the other parts of the genital are turgid in the act of copulation, these tubæ also may be in some measure erected, and extend their opened mouth to the testicle, to impregnate the ova with the feminal air steaming through their duct, and if any one be fecundated and separated, to receive it afterwards by its orifice.

As to the second objection, which urges the narrowness of these tubæ: he that considers the straitness of the inner orifice of the womb, both in maids and in women with child, and yet observes it to dilate so much upon occasion as to permit an egress to the child out of the womb, cannot wonder that to serve a necessary end of nature the small duct of the tubæ should be so far widened as to give passage to an ovum, seeing its proportion to their duct is many times less than of the child to the usual largeness of the said orifice.

S E C T. XIV.

Of the Uterus or Womb, and its Neck.

HAVING treated of the vasa præparantia (so called) that bring nourishment to the testes or ovaria, as also of these and their ova, and lastly of the tubæ through which the ova pass to the womb; we now come to the womb itself which receives the ova, and in which the conception is formed, and the foetus nourished till it acquire its due maturity, and be fit for the birth.

The uterus, or womb, is usually divided into four parts, the fundus or bottom, os internum or cervix, the vagina, and the

the sinus pudoris, or outward privity: of each of these in order; and first, of the fundus.

This in a special manner is called the womb, because all the rest seem to be made for its sake. It is also called matrix, from its being as a mother to conserve and nourish the foetus; and likewise utriculus, from its shape resembling that of a bottle: though it is not quite round, but a little flat, like a Spaw water bottle, to which Verhegen compares it.

It is seated in the hypogastrium, or lowest part of the abdomen, in the middle of that large hollow that is called pelvis, and is formed the osso ilii, coxæ, the ossa pubis, and the os sacrum.

In this cavity it is placed between the bladder and the straight gut; so that man being bred betwixt piss and dung, if he would but consider his origin, might hence draw an argument of humility.

Its hindmost part is loose, that it might be extended as the foetus encreaseth. But its sides are tied fast by two pairs of ligaments.

The first pair are further from the os internum, and are broad, arising from the peritonæum. They have a membranous, loose and soft substance, and for their shape are resembled to a bat's wings. They tie the sides of the fundus, the testes, and a good part of the tubæ together, and are fastened to the ossa ilii, whereby the womb is kept from falling down upon its neck. But if they be either immoderately relaxed, or by any violence broken, then the womb descends, and sometimes falls out (turning aside outwards) if the substance of the womb happen to be relaxed also.

The second pair arise nearer to the inner orifice of the vagina, about where the tubæ do, and are called the round ligaments, or worm-like. From their origin, which is broad, they ascend on each side between the duplicature of the peritonæum toward the groins, and running out of the cavity of the abdomen become round, and then pass obliquely above the os pubis, towards the fat of mons veneris, in which they terminate near the clitoris, being divided into many parts or jags. They consist of a double membrane, the inner whereof has all sorts of vessels, nerves, arteries, and vasa lymphatica; and are about a span long, and receive a small feminal

vessel from the testes and tubæ, which they conduct to the clitoris, into which they are inserted, and ought rather to be accounted vasa deferentia, than ligaments. So that what some women emit from about the clitoris in coition, they think to be true semen, conducted hither by those seminal ducts. But de Graef denies any such ducts, and affirms, that these ligaments reach not the clitoris, but are terminated in the aforesaid fat. And that humour which women emit (sometimes) he thinks issues out of the lacunæ, in the orifices of the vagina and urinary passage, or also from the meatus's in the neck of the womb: which humour is supplied to the former parts from the thick and membranous body that is about the urinary passage; and to the latter, from the nervous membranous substance of the neck of the womb; but he thinks it does not partake of the nature of the seed, but serves only for the lubricating of the vagina to cause the greater pleasure in coition.

Its substance is whitish, nervous or rather membranous; dense and compact in virgins, but in women with child a little spongy and soft.

It is composed of three membranes. The outermost, is very fibrous, compact, and tough, without any discernible vein or artery. The middle is much thicker, and endued with carnos fibres, and as some think, ought rather to be called the substance of the womb, than a membrane. It is full of blood-vessels, very remarkable at all times, but especially in the flux of the menses, or in the time of gestation. During this latter time, this coat (with the inmost) imbibes so much of the nutritious humours that then flow hither, that the more the foetus encreaseth, and consequently the more distended the womb, the more fleshy and thick doth it grow. And yet (which is strange) within sixteen or twenty days after a woman is brought to-bed, it becomes as thin as before, and the whole womb contracts into so little a compass as to be held in one's hand.

The inmost likewise abounds with blood-vessels propagated into it from the middle one, and is full of pores, by which the blood in the menstrual flux is extravasated out of the arteries into the womb, and upon impregnation, the succus nutritius exsudes into the same, and by which also, both
blood

blood and chyle are conveyed into the placenta uterina after the formation thereof.

In virgins it is about two fingers breadth broad, and three long, in those that have lain with a man it is a little bigger, and something larger in women that have borne children.

In maids its cavity is so small that it will hardly hold a large hazel-nut. In those that have had children it will hold a small walnut. It is divided into no cells, as it is in most viviparous brutes, but only into the right and left side by a suture or line that goes lengthways, much like that on the outside of the scrotum in man. Its cavity is not quite round, but jets out a little towards each side; which jetting some call horns, but improperly: for though Galen (and many after him) having never dissected any woman, presuming that their womb was like that of other viviparous creatures, attributed cornua thereto; yet in truth they have none; but the tubæ fallopianæ (as was noted before) answers to them in many respects. Only in brutes (viz. such as have cornua) the conception is always formed in the cornua, as being the greatest part of the uterus, (which from the very orifice of its fundus is presently divided into them, as when one parts the fore from the middle finger as wide as one can) but very rarely in the tubæ in women, but most an end in the fundus itself.

Its arteries spring partly from the spermatick and præparantes, and partly from the hypogastrick. These two arteries do on each side by a notable branch inosculate one with the other. And both their branches that run on one side the womb, do inosculate with those of their own stock on the other. Which may plainly be seen by blowing into the trunk of either of them on which side you will, for then the branches on the other side will be puffed up, as well as those on that side you blow.

They run along the womb not with a straight or direct course, but bending and winding, that they may extend without danger of breaking when the womb is enlarged to so great a bulk by the foetus. By these arteries it is that the menses flow, in greatest quantity out of those branches that open into the uterus itself, but in lesser out of those branches that reach and open into the cervix or neck of the womb, and in least (if at all) out of the vagina. As

As to the reason of the menstrual flux, 'tis not likely that the redundance of blood is the sole cause of it; for then would the term of the flux come sooner or later according as the diet should be more full, or more sparing. Whereas experience shews, that let a woman feed never so high, and so breed never so much blood, this flux comes never the sooner, (though perhaps it may be larger;) or let her use the most spare diet, and (if she be healthful) it will be never the longer a coming. Wherefore, besides a sufficient stock of blood there seems requisite also a fermentation therein, to the producing this flux; which fermentation, by what it should be caused, is hard to determine. Those who grant seed to women, derive it thence; because as soon as girls comes to puberty; and desire and become fit for coition, the menses begin to flow. But concluding, according to the moderns, that women have no seed, the same can be no cause hereof. Astrological reasons I account vain, seeing there are menstruous women at all seasons; and the same women have their menses, in process of time, at all ages of the moon.

Other reasons may by the curious be offered, but all those I have met with are unsatisfying. Waving them therefore, supposing a fermentation in the blood to be the principal cause, we shall only add a word of the immediate reason or manner of the flux: when through this fermentation the blood flows so plentifully into the uterine arteries, that the veins (which are fewer than the arteries) cannot return it all back again by the circulation, it bursts forth of the extremities of the arteries so long, till the too great quantity of the blood be lessened and the fermentation ceases, which it does ordinarily after three or four days; and so that flux stops till the next period. In women with child they seldom flow, either because the redundant blood is then bestowed on the nourishment of the foetus, according to the old hypothesis; or according to the new, because it is defrauded of a considerable part of the chyle (or nutritious juice) which is consumed by the foetus, whereby it becomes diminished and depauperated, which is the reason why nurses also seldom have them.

The veins do likewise spring from the præparantes, and from the hypogastrick. There are many anastomoses of these veins one with another, (as there was noted of the arteries)

teries) but especially in the sides of the uterus, which do more readily appear by blowing of them up, than those of the arteries above spoken of. The blood brought hither by the arteries, that is not spent on the ordinary nutrition of the womb, or is not cast out when the menses flow, returns by these veins back to the heart.

It has nerves from the plexus mesenterii maximus of the intercostal pair, and from the lowest plexus of the same. As also from the nerves of the os sacrum. And the same run also to the testes or ovaria. Now it is these plexus or nerves that are chiefly affected in the hysterical passion, of fits of the mother. For these fits are merely convulsive, and often happen without any fault of the womb at all. And that symptom that in such fits is usual, namely when something like a ball seems to rise from the bottom of the belly, and to beat strongly about the navel, (which is usually taken by women for the rising of the womb or mother) is nothing but the convulsions of the plexus or nerves: which one may rather believe when he considers that some men are afflicted with the same symptom.

De Graef says, there are many lympheducts that creep through the outer substance of the uterus, which one after another, meeting into one, empty themselves into the common receptacle: and those he says, Bartholin mistakes venæ lactæ.

The use of the womb is to receive into its capacity the principles of the formation of the foetus, to afford it nourishment, to preserve it from injuries; and at length, when it grows to maturity, and requires the light and a freer air, to expel it forth.

The cervix or os internum of the womb being continuous to it, and coming betwixt it and the vagina, we will treat of it in this Sect. It seems to be part of the fundus, or of the womb, properly so called, only it is much narrower, for its cavity is no wider in virgins than a small quill, and in women with child its inner orifice doth either quite close its sides together, or is daubed up with a slimy yellowish humour, so that nothing can then enter into the womb, unless in very lustful women it be sometimes opened in superfoetation. It is an inch or more in length. Its cavity, as it opens

to the vagina, is compared to the mouth of a tench, Galen likens its passage to that in the glans of a man's penis; for it is not round, but long and transverse. It is wrinkled, and has many small ducts opening into it, out of which one may press a pituitous serous matter. It has the same membranes and the same vessels with the uterus itself. De Graef says, that amongst its wrinkles he has often observed hydatides, or little watry bladders; and thinks, that the abovesaid serous matter serves only to moisten the vagina, &c. and to excite to venery.

S E C T. XV.

Of the Vagina and its Contents.

CONTINUOUS unto the cervix is the vagina, so called, because it receives the penis like a sheath. It is called also the door of the womb, and its greater neck.

It is a soft loose pipe, uneven on its inside with orbicular wrinkles, of a membranous but somewhat spongy substance (which lust causeth to puff up a little, that it may embrace the yard more closely) about seven fingers breadth long, and as wide as the streight gut: all which yet, both length, width, and looseness differ in respect of age, &c. and as a woman is inflamed more or less with lust. So also the abovesaid wrinkles are much more numerous and close set in virgins, and in women that seldom accompany with a man, and that have never borne children, than in those that have borne many children, and in whores that use frequent copulation, or those that have long laboured under the fluor albus, (or whites) for in all these sorts they are almost obliterated. Its thickness on the upper side, is about a straw's breadth; but on its lower it is twice as thick.

Stockhammer says, it consists of a spongy and glandulous substance, through which not only plentiful branches of veins and arteries from the hypogastrick and hemorrhoidal are dispersed, as also nerves from the os sacrum; but it has also proper excretory ducts, which gape like pores in its inner cavity, and are most numerous near the urinary passage.

And

And this substance is contained between two membranes, of which the inner is nervous and wrinkled, the outer carnous.

It has very many arteries and veins, some of which inosculate one with another, and others not: by the arteries that open in it do the menses sometimes flow in women with child that are plethorick; for they cannot come from the womb unless abortion follow, as sometimes it does. These vessels bring plenty of blood hither in the venereal congress, which heating and puffing up the vagina encreaseth the pleasure, and hinders the man's seed from cooling before it reach the uterus. They spring not only from the hypogastrick, but also from the hemorrhoidal, but the latter run only through the lower part of the vagina. Its nerves Doctor Willis thus describes: from the lowest plexus of the abdomen two nerves are sent into the pelvis, where each receives a notable vertebral nerve, and so they make two plexus, one on each side, from which there arise two ascending nerves, that run to the intestinum rectum, and two descending, that are carried to this part we are speaking of.

Casp. Bartholin says, he has never observed a gland on each side of a woman's vulva, but inclines to believe they are not wanting in them; and thinks the liquor which is sometimes emitted by them in pleasure, issues a great part of it from hence. The glans, he says, are of the conglomerate kind, and are invested round with peculiar and proper carnous fibres, which seem to arise from the sphincter of the bladder, as those which incompass the prostate in men do according to the observation of De Graef: and therefore he thinks these glands in females are in lieu of the prostatae in men.

Near its outer end, between the nymphæ in its fore and upper part, it receives the neck of the urinary bladder encompassed with its sphincter: opposite whereto in its hinder or lower part it is strongly knit to the sphincter of the streight gut. The urinary passage, or urethra, is not above two fingers breadth long from the neck of the bladder to its end, and about as wide as a goose-quill.

The hymen is a thin nervous membrane interwoven with carnous fibres, and endowed with many little arteries and veins, spread across the duct of the vagina behind the insertion of the neck of the bladder, with a hole in the midst

that will admit the top of one's little finger, by which the menses flow. It is otherwise called the zone or girdle of chastity. Where it is found in this form described, it is a certain note of virginity; but upon the first congress with a man it is necessarily broken which is usually accompanied with an effusion of blood; which blood is called the flower of virginity; and of this the text makes mention, Deut. xxii. verses 13, 21. And when once it is broke, it never closes again.

But though this effusion of blood upon coition from the rupture of this membrane, (or perhaps of capillary vessels of the vagina) be a certain token of virginity; yet it will not follow on the contrary, that where it is wanting, virginity is also wanting. For the hymen may be corroded by acrimonious fretting humours flowing through it with the menses; or may be violated by the falling out or inversion of the uterus, or the vagina at least, which sometimes happens even to maids; or lastly, perhaps the indiscreet and unwary bride has had her menses a day or two before marriage, in which case both the hymen and the inner wrinkled membrane of the vagina are flaggy and relaxed, that no such rupture, and by consequence no such effusion may happen.

In some there naturally wants a foramen in the hymen, by which means there being no exit for the menses, such are in great danger of their life, if they are not relieved by surgery, viz. by opening it with a sharp instrument.

Close to the hymen lie the four carunculæ myrtiformes, so called from their resembling myrtle-berries. The largest of them is uppermost, standing just behind the mouth of the urinary passage, which it helps to shut. Opposite to this, in the bottom of the vagina, there is another, and on each side one, so that they stand in a square. But of these there is only the first in maids, the other three are no caruncles, but little knobs made of the angular parts of the broken hymen rolled into a heap by the wrinkling of the vagina, according to Riolanus and Diemerbroeck. These three, when the vagina is extended in a woman's labour, lose their asperity and become smooth, so that they disappear, until it be again contracted to its natural straitness.

The

The outer orifice of the vagina in virgins, especially the younger, is very narrow, and much straiter than the rest of the vagina.

Having thus described the parts of the vagina, its use is easily declared, viz. to receive the man's yard, being erect, to direct and convey the seed into the womb, to serve for a conduit by which the menses may flow out, and to afford a passage to the foetus in its birth, and to the after-birth.

S E C T. XVI.

Of the Pudendum Muliebre, or Woman's Privity.

THE parts that offer themselves to view without any deduction, are the *fisura magna* or great chink, with its labia or lips, the *mons veneris* and hairs. These parts are called by the general name of *pudenda*, because when they are naked, they bring pudor or shame upon a woman.

The great chink is called *cunus* by Galen, from *kuein* to conceive; by Hippocrates, *natura*. It is also called *vulva*, *porcus*, *concha*; and by many names that fancy has imposed upon it.

It reaches from the lower side of the *os pubis* to within an inch of the anus; being by nature made so large, because the outer skin is not so apt to be extended in travail as the membranous vagina and *collum minus* are. It is less and closer in maids than in those that have borne children. Its length makes the *perinæum* not above an inch long. It has two lips, which towards the pubes grow thicker and more full or protuberant, and meeting upon the middle of the *os pubis* make that rising that is called *mons veneris*, or the hill of Venus.

The inner substance of this hill, which makes it bunch so up, is most of it fat; and under the fat lies that sphincter muscle that was spoke of in the last chapter, that constricts the orifice of the vagina, and springs from the *sphincter ani*.

By a little drawing aside the lips, (or *labiæ*) there then appear the *nymphæ* and the clitoris.

The *nymphæ* are so called because they stand next to the urine as it spouts out from the bladder, and keep it from

wetting the labia. They are called also pterugia or wings. They are placed on each side next within the labia, and are two carnous, soft and spongy productions, beginning at the jointing of the ossa pubis or upper part of the privity, (where they are joined in an acute angle, and makes the wrinkled membranous production that clothes the clitoris like a præputium or fore-skin) and descending close all the way to each other, when the pudendum is shut, reaching out about half the breadth of the orifice of the vagina, and ending each in an obtuse angle. They are almost triangular, and therefore, as also for their colour, are compared to thrills that hang under a cock's throat.

They have a red substance, partly fleshy, partly membranous; within soft and spongy, loosely composed of thin membranes and vessels, so that they are very apt to be distended by the influx of the animal spirits and arterial blood. Animal spirits they have from the same nerves that run through the vagina, and blood from that branch of the inner iliacal artery that is called pudenda: veins they have also from the venæ pudendæ, which carry away the arterial blood from them when they become flaccid. They are larger in grown maids than in younger, and larger yet in those that have used venery or borne children.

There use is to defend the inner parts, to cover the urinary passage, and a good part of the orifice of the vagina, and to the same purposes serve the labia or lips above described.

Above, betwixt the nymphæ in the upper part of the pudendum, does a part jet out a little that clitoris, from kleito-eiza that signifies lasciviously to grope the pudendum. It is otherwise called virga, for it answers to a man's yard in shape, situation, substance, repletion with spirits and erection; it has nervous bodies, a septum, a glans, muscles, and the like vessels with the penis. But it differs therefrom, first in magnitude; for this is very small, as not to be blown up to the thickness of ones little finger. Secondly, the forked roots or crura of the nervous bodies that lie hid within the fat of the pubes, are twice as long as that part of it which is united into the body with the septum between; whereas on the contrary in the penis the emitted part is four times as long as the forked. Thirdly, the clitoris wants an urethra, and

its prominent glans wants a foramen. Fourthly, it has only one pair of muscles. In some its united part grows to that length, as to hang out from betwixt the lips of the pudendum: yea, there are many stories of such as have had it so long and big as to be able to accompany with women like unto men, and such are called fricatrices, or otherwise hermaphrodites; who, it's not probable are truly of both sexes, but only the testes fall down into the labia, and this clitoris preternaturally extended. But in most it jets out so little as that it does not appear but by drawing aside the labia: and its ordinary bigness is like that of the uvulæ (or columella) not relaxed, to which Verheyen compares it.

It is a little, long and round body, consisting (like a man's penis) of two nervous, and inwardly black and spongy parts, that arise on each side from the bunching of the os ischium, and meet together at the jointing or conjunction of the ossa pubis. It lies under the fat of mons veneris, in the top of the great fissure. In venery, by means of the nervous bodies, it puffs up, and straitening the orifice of the vagina contributes to the embracing of the penis the more closely.

Its outer end is like to the glans of a man's yard, and has the same name, (as also tentigo.) And as the glans in men is the seat of the greatest pleasure in copulation, so is this in women; whence it is called amoris dulcedo and oestrum veneris. It has some resemblance of a foramen, but it is not pervious. It is most of it covered with a thin membrane from the conjunction of the nymphæ, and which, for its likeness to the præputium in men, is also called so.

The clitoris has formerly been affirmed to have two pair of muscles belonging to it. The upper are round, and spring from the bones of the coxendix, and passing a little way along the two nervous bodies above-described are inserted into them. These by straitening the roots of the said bodies do detain the blood and spirits in them, and so erect the clitoris, even as those in men do the penis. And this is the only pair which we suppose belong to the clitoris; as for the other which arise from the sphincter ani, they are those we mentioned in the end of the other chapter: for though they have been thought to serve for the erection of the clitoris, yet we think with de Graef, that they are rather of the nature of a sphincter,

sphincter, and contribute to the purring up on constringing the outer orifice of the vagina.

It has veins and arteries from the pudendæ, and nerves from the same origin with the vagina, which are pretty large.

Its use may be known from what has already been discoursed. And we will only note further, that in some Eastern countries it uses to be so large, that for its deformity, and the hindrance it gives to copulation, they use to cut it, which they improperly call circumcision.

S E C T. XVII.

Of Conception.

HAVING described all the parts that serve for generation both in man and woman, I shall now speak of the efficient causes, matter or principles, from whence that which is generated by and in them, doth proceed, meaning conception.

In the first place there occurs the man's seed, which is the active principle, or efficient cause of the foetus; but when we discoursed of the testes, we shewed what the matter of it was, viz. Arterial blood and animal spirits; and as to the manner of its fecundating the ovum, we omit that, as being too philosophical for this place. In the next place we must come to the matter or passive principle of the foetus, and this is an ovum impregnated by man's seed. And here, because in women it cannot be observed by what degrees and in what time an ovum in the ovarium or testes becomes a conception in the uterus, we must be forced to guess at that by the analogy in other creatures.

To this purpose Doctor Harvey de generatione animalium, is worthy to be read of the curious; especially concerning the manner and order of generation of the parts of a chicken in hen's egg, in his exercit. 56. But when he comes to apply this to the conceptions of viviparous animals, being ignorant that there was any formal ovum pre-existing in them, and only then fecundated, he runs into great errors and odd notions about conception; imagining an analogy betwixt the

the brain's formed its phantasms or conceptions (which he calls animal) and the womb's forming her's, which he calls natural. He rightly indeed rejects the hypothesis of a woman's having true seed, as also the notion that man's seed is any part of conception; but that he gives an unsatisfactory account of it, when he says, it is formed of the primeval albugineous humours that transude into the cornua in brutes, or uterus in women, after they are impregnated or matured, as he speaks. For those albugineous humours (as shall be shown more fully afterwards) are not the first principle from which the foetus is formed, but the matter whereby its lineaments first drawn within the ovum, receive their encrease and perfection. I shall not therefore rehearse the history of generation in harts that he has given us, for an analogical explanation of that in women; but shall transcribe the observations of the curious De Graef concerning generation of rabbits, as being more adapted to our purpose, and more consonant to truth.

' We made the first tryal (says he) on a female rabbit that
' had not accompanied with the male. Dissecting which we
' observed a very wide vagina, and about eight fingers breadth
' long; which being opened lengthways, there stood out narrow
' mouths in its upper part divided with a semilunar partition,
' namely the beginning of each cornu: for the womb
' in conies is presently from the very vagina divided into two
' parts, one of which bends towards the right hand the other
' towards the left, about three fingers breadth asunder,
' where they are presently contracted and continued with
' the oviducts, which in these animals have a peculiar situation
' (or make :) because if you lightly blow up the cornua,
' these will not swell, nor the wind penetrate them, because
' of some loose fimbriae or jags closing like the valve of the
' gut colon.

' These oviducts being small at their rising from the cornua,
' for five fingers breadth run with a winding duct beyond
' the testicles, widening more by degrees, and then they
' turn back towards them, and end in the form of a funnel.
' The testicles are small, but contain very many limpid eggs,
' which being cut open, there issued out a clammy liquor
' like the white of an egg. This being premised, we opened
' another

• another half an hour after the coitus, the cornua of whose
 • uterus looked a little redder, but the ova in the testicles
 • were not yet changed, unless they had remitted a little of
 • their clearness: but neither in the vagina nor in the cornua
 • could we perceive any seed, or any thing like it.

• About six hours after the coupling we dissected another,
 • in whose testicles the folliculi (or cales) of the ova inclined
 • to redness, out of which being pricked with a needle, a
 • clammy and clear liquor issued first, but blood followed,
 • flowing out of the sanguinary vessels dispersed through the
 • folliculi: we could find no seed neither in this coney.

• Four and twenty hours after the coitus, we opened ano-
 • ther, in one of whose testicles we found three, and in the
 • other five folliculi of the ova very much changed; for be-
 • ing before limpid and colourless, they were now turned
 • dusky and a faint red, in the middle of whose superficies
 • a little papilla (or teat) as it were discovered itself: when
 • the folliculi were cut open, there appeared a little limpid
 • liquor in their middle, and in their circumference a certain
 • thicker and reddish matter.

• Twenty-seven hours after coitus we inspected another,
 • the cornua of whose uterus with the oviducts looked more
 • bloody, also the extremity of the oviducts did on every
 • side embrace the testes like a tunnel; in the middle super-
 • ficies of the folliculi, as in those before, there stood out lit-
 • tle papillæ, through which by pressing the substance of the
 • testicles there issued a limpid liquor, which was followed by
 • another redder and thicker. Opening the cornua of the
 • womb we found no eggs, but the inner wrinkled tunicle
 • of the cornua was little more turned.

• Eight and forty hours after the coitus we examined ano-
 • ther, in one of whose testicles we found seven, in the other
 • three folliculi changed, in whose middle the papillæ were
 • something more eminent, through which, by pressing the
 • substance of the testicles, there issued a little liquor like
 • the white of an egg; but the remaining reddish substance
 • of the ova, being now come somewhat thicker, was not
 • easily pressed forth as in those before.

• Two and fifty hours after the coitus we viewed another,
 • in one of whose testicles we found one, in the other four fol-
 • liculi

liculi altered; cutting open which we found a glandulous-like matter, in the middle of which there was a little cavity, wherein finding no notable liquor, we begun to suspect whether or no their limpid substance, which is contained in proper membranes, was burst forth or expelled; wherefore we searched carefully both the oviducts and the cornua, but we could find nothing; only the inner tunicle of the cornua being much put up, shined.

Three days and nights after the coitus we inspected another, which exhibited a far other and most wonderful change; for the infundibulum did embrace the testicles on every side most closely, which being pulled off we found in the testicle of the right side three folliculi a little larger and harder, in the middle of whose superficies we saw a tubercle with a little hole in it like a papilla; but dissecting the said cases through the middle, their cavity was quite empty: wherefore we searched the ways through which the ova must pass, again and again, and found in the middle of the right oviduct one, and in the outer end of the cornu of the same side two very small eggs, little bigger than small pins heads, which notwithstanding their smallness are cloathed with a double coat; out of these eggs being pricked, there issued a most limpid liquor. In the very beginning of the cornu of the left side we found only one egg, just like those small ones of the other side; whence it is clear that the ova excluded out of the testes are ten times less than those that yet stick in the testes; which seems to us to come to pass inasmuch as those that are still in the testes contain as yet another matter, namely, that of which the glandulous substance of the cases is made.

The fourth day from the coitus we opened another, in one of whose testicles we found four, in the other three globules cases emptied; and in the cornua of the respective sides we found many eggs, greater than the former, which did not stick in the oviducts or beginnings of the cornua, but were now rolled on towards their middle: in the cavity we beheld as it were another egg swimming far clearer than in the other before.

The fifth day from the coitus, we dissected another, in whose ovaria or testicle we told six emptied folliculi, that

‘ had each a notable papilla, through whose foramen we easily
 ‘ put an ordinary bristle into their cavity : we found also the
 ‘ same number of eggs (bigger than those the day before) in
 ‘ divers parts of the cornua, in which they lay so loosely, that
 ‘ by blowing only, one might drive them this way or that
 ‘ way. The inner tunicle of those (or the egg within an egg
 ‘ as it were) was become yet more conspicuous.

‘ The sixth day from the coitus we examined another, in
 ‘ one of whose testicles we observed six cases emptied, & in the
 ‘ cornu of the same side we could light of but only five eggs
 ‘ near the vagina, brought as it were upon a heap, &c.

‘ The seventh day from the coitus we examined another,
 ‘ and found the eggs bigger than the day before, and so on
 ‘ till the tenth day, at which time we could plainly discern
 ‘ the placenta, to which the egg, by means of its chorion, was
 ‘ annexed. The matter of the eggs boiled with the womb
 ‘ hardened like the white of an egg, and tasted like the boiled
 ‘ congealed substance of the eggs in the testicles.

‘ The twelfth day after coitus we opened another, and in
 ‘ one of the testicles we found seven, in the other five folliculi
 ‘ emptied, and as many cells in the cornua much bigger and
 ‘ rounder than in any before, in the middle of which the
 ‘ embryo was so conspicuous, that one might discern its
 ‘ limbs. In the region of its breast two sanguineous specks,
 ‘ and as many white ones did offer themselves to view; in
 ‘ the abdomen there grew a certain mucilaginous substance,
 ‘ inclining here and there to red. We could not discern more
 ‘ in this shapeless little animal because of its tenderness.

‘ The fourteenth day after the coitus we dissected another,
 ‘ the cells of whose uterus we beheld to be yet greater, & their
 ‘ sanguineous vessels more, and more turgid : we also noted
 ‘ that the cells, the larger they grew, came nearer to each
 ‘ other, and their interstices were lessened. The membranes
 ‘ amnios and chorion were knit together, which though they
 ‘ appear thicker and stronger, are yet more hard to be sepa-
 ‘ rated from one another than in the ova taken intirely out of
 ‘ the womb; tearing these we saw an embryo with a great and
 ‘ pellucid head, with the cerebellum copped; its goggle
 ‘ eyes, gaping mouth, and in some sort its little ears might be
 ‘ discovered also. Its back-bone was drawn out, of a white
 ‘ colour,

‘ colour, which bending in about the sternum resembled a
 ‘ ship; by whose sides most slender vessels run, whose ramifi-
 ‘ cations were extended to the back and feet. In the region
 ‘ of the breasts two sanguineous specks, greater than in the be-
 ‘ fore mentioned, exhibited the rudiments of the heart; at the
 ‘ sides whereof were seen two whitish specks for lungs. In
 ‘ the abdomen, being opened, there first shewed itself a red-
 ‘ dish liver, then a white body, to which was knit a mucila-
 ‘ ginous matter like a writhed thread, being the rudiments of
 ‘ the stomach and guts. All which in those we dissected af-
 ‘ terwards acquired only a greater bulk and perfection; only
 ‘ on the twenty-ninth day, when we dissected another, we
 ‘ saw in its cavity eleven foetus sprawling, which were all so
 ‘ closely coupled together by the membrane chorion (where-
 ‘ in all are severally involved) as if they had all been includ-
 ‘ ed in one and the same chorion.’

Thus much I thought fit to translate of that accurate ana-
 tomist's observations concerning the generation of this sort
 of animal, because it gives so very great light into the man-
 ner of the generation of an human foetus, for there is an ex-
 act analogy betwixt them, abating some circumstances; as
 first, that in women the conception is not formed in the cor-
 nua, seeing her womb has none, nor in the tubæ very seldom
 and according to nature, for they are only the infundibula
 or oviducts to convey the ova from the testes to the fundus
 uteri, though they bear some resemblance to the cornua in
 brutes; I say, the conception is not formed in these, but in
 the fundus uteri or womb properly so called, where, into the
 ovum being received, presently begins to swell and grow
 bigger, and there appears as it were an egg within an egg,
 by means of the two membranes are originally in the ovum
 while it is in the testicle, and imbibe the moisture that is sent
 now plentifully into the womb. For seeing those go with
 young but twenty-nine or thirty days, and women nine
 months, we must imagine that the embryo is perfectly form-
 ed in the tenth day, as in the latter in the tenth week, or lon-
 ger. But I say, abating these, or if there be any other such
 like circumstances, there is so great a likeness betwixt the
 one and the other, that without insisting more on the mat-
 ter or manner of conception, we shall pass on to the descrip-

tion of the parts that encompass the foetus, then shew how it is nourished, and lastly, what parts of it differ from those in a child born.

S E C T. XVIII.

Of the Placenta Uterina, or Womb-Liver, and Acetabula.

UPON the cutting open the womb of a woman with child, the first thing that immediately offers itself is the placenta uterina, or womb-liver, from its likeness of substance, and also use, according to those that imposed the name.

Its substance is very much like the spleen, only that is more brittle, and this more tough and tenacious, so that it cannot so easily be separated from the vessels. It is soft, and has innumerable fibres and small vessels. Its parenchyma is partly, if not altogether, glandulous.

Doctor Fred. Ruysch affirms, (as he does of the spleen) that it has no fibres, no peculiar glands, nor cells, with blood-vessels placed between, but that its fabrick is only an aggeries of arteries and veins.

It is of different shapes in several creatures, but in women it is circular, yet with some inequalities in its circumference. It is two fingers breadth thick in the middle, (but thinner near the edges) and a span or a quarter of a yard over from one side to the other, when the foetus is come to maturity ready for the birth. On that side next the foetus it is smooth and something hollowish, like navel-wort, and grows every where firmly to the chorion; but on that next the womb it is very unequal, having a great many tubercles or bunchings, whereby it adheres fast and immediately to the womb; but to what part of it, is not agreed amongst anatomists, some affirming it to grow to the forepart, some to the hinder part, some to the left side, and some to the right. But Doctor Wharton says, it always adheres to one of the two corners of the womb, whereinto the foramen of the tubæ opens; so that the said foramen is as it were the centre to the placenta. De Graef thinks it is most commonly fastened there, but not always, because the ovum for a while being loose in the cavity of the uterus, may be tumbled to this or the other part,

part, and wherever it fixes, there it is joined to the womb by the placenta.

When there is but one foetus in the womb, it is but one; but if there be twins, then, according to Wharton and others, are there two placentæ, either distinct in shape of one, then are they separated by a membrane one from the other; and a particular rope of umbilical vessels is inserted into each from each foetus.

But Doctor Needham affirms, that there is generally but one placenta, even when there are two or more foetus. Nor does that line that seems to divide the placenta from one another, really do so; for the vessels of the right hand foetus extend beyond this line to the left side of the placenta; and vice versa. 'Tis but seldom, says he, that the placentæ are multiplied according to number of the embryo's.

It does not grow out of the womb originally, but its first rudiments appear like a woolly substance on the outside of the outer membrane that invests the embryo (called chorion) about the eighth or ninth week, upon which in a short while a red, carnos and soft substance grows, but unequally and in little knobs, and then it presently thereby sticks to the womb, & is very conspicuous about the twelfth or thirteenth week. Till now the foetus is encreased and nourished wholly by the apposition of the crystalline or albugineous liquor wherein it swims loose in the inner membrane (called amnios) having no vasa umbilicalia formed, by which to receive any thing from the placenta. But when it grows bigger and begins to need more nourishment, the extremities of the umbilical vessels begin to grow out of the navel by little and little, and are extended towards this placenta; that out of it, as plants by their roots out of the earth, they may draw a more firm nutritive juice, and carry it to the foetus.

It certainly has vessels from a double origin, some from the womb, and some from the chorion immediately, but mediately from the foetus. The former are of four kinds, arteries, veins, nerves and lympheducts: all which, though they are very large and conspicuous in the womb, & are so even in that very place where the placenta is joined to it: yet they send but the smallest capillaries into the placenta itself, and are dispersed only through the side of it, that is
the

the womb. Those that come from the chorion are arteries and veins, and Doctor Wharton supposes also lympheducts.

The arteries and veins that come from the womb spring from the hypogastricks, and also that branch of the spermaticks that is inserted into the bottom of the womb. Those that come from the chorion are the umbilical vessels of the foetus.

When we come to discourse how the foetus is nourished; as also the use of the placenta itself, of which we shall only observe this further here; that after it is joined to the womb, it sticks most firmly to it for the first months, as unripe fruits do to the tree: but as the foetus becomes bigger, and riper, and nearer to the birth, by so much the more easily will it part from the womb; and at length, like to ripe fruit, after the child is born, it falls off from the womb, and makes part of the after-birth.

It was an old tradition continued for many hundred years, that the placenta adheres to the womb by certain parts called cotyledones or acetabula. That there are such in some creatures it is certain; Dr. Needham says, they are only properly so called in sheep and goats, in whom being with young the uterine glands are hollow like a saucer or an acorn-cup, and are adapted to the little prominences (or digituli) of the placenta that grow on the chorion, (though Diembroeck says, that on the contrary the placenta are hollow, (and so are truly the acetabula) and the uterine glands protuberant) and doubts not but these names were first given by those that dissected these kind of creatures, and were afterwards applied in following ages to other animals. So that no wonder there have been so great contests ever about the signification of the word cotyledon, (which is the Greek word for the herb umbilicus veneris, or navel-wort) and what that was called in the several creatures that were said to have them. But because such controversies are now obsolete, and that 'tis generally confessed that women have them not, we shall not in this epitome run out into needless disputes; but only observe one singular opinion of Diembroeck, who ascribes cotyledones to women. He thinks that each woman (unless she goes with twins) has but one cotyledon, and that the fore-said placenta uterina is it. And indeed it must be confessed that

that it resembles much the shape of that from which the cotyledons have their name; and therefore seeing he formed this opinion, to defend our great master Hippocrates, who had ascribed them to women, (that is, as Diembroeck expounds it, one cotyledon to one woman) we shall not oppose it, but confess it to be, if not true.

S E C T. XIX.

Of the Membranes involving the Fœtus, and of the Humours and Air contained in them.

NEXT to the placenta follow two membranes that involve the whole foetus, chorion the outer, and amnios the inner: betwixt which two, after the foetus is perfectly formed, Doctor Needham, &c. affirms, there is a third, viz. allantoides, which women likewise includes the whole foetus, the explanation of which follows.

The outmost membrane is called chorion, it is pretty thick, smooth on the inside, but on the outside unequal or rough, and that part of it that adheres to the placenta and by it to the womb, has very many vessels, which spring from the placenta, and from the umbilical vessels. Those which spring from the placenta are dispersed through it before the foetus is shaped, (as Diembroeck affirms;) but the latter not till the navel-rope is grown out to a just length, at which time they enter it and intermix with the former, and from this membrane are inserted into the placenta to which the chorion adheres. It is but one even when the mother goes with twins: for, as in a nut that has two kernels in it, they are both included within the same shell, but are each invested in their proper membrane; so twins are both enclosed in one chorion, but have each a particular amnios.

It invests the ovum originally, which ovum being brought into the womb, and becoming a conception, this membrane imbibes the moisture that bedews the womb plentifully at that time. For while the conception is loose in the womb, and has no vessels that reach out of itself, nor is fastened to any part, it must have its encrease after the same manner as the egg has in hens, which, while it is in the racemus or
‘ knot,

' knot, consists of no other substance but yelk ; and when it
 ' drops off from thence and descends through the infundibu-
 ' lum, it receives no alteration ; but when it comes into the
 ' cells of the process of the uterus, it begins to gather a
 ' white, altho' it stick to no part of the uterus, nor has any
 ' umbilical vessel ; but (says my author, the immortal Har-
 ' vey) as the eggs of fishes and frogs do without procure to
 ' themselves whites out of the water ; or as beans, pease, and
 ' other pulse, and wheat being steeped in moisture swell, and
 ' thence acquire aliment for the bud that is springing out of
 ' them : so in like manner, out of the plica or wrinkles of the
 ' womb (as out of a dug or womb-cake) does there an albu-
 ' gineous moisture flow, whence the yelk (by that vegetative
 ' and innate heat, and faculty wherewith it is endued) gathers
 ' and concocts its white, and therefore in those plicæ and the
 ' hollow of the womb does there plentifully abound a liquor
 ' resembling the taste of the white. And thus the yelk de-
 ' scending by little and little is encompassed with a white, till
 ' at last in the outmost uterus, having assumed membranes
 ' and a shell, it is perfected.' Thus, I say, does the chorion
 imbibe that albugineous liquor that from the first conception
 encreases daily in it (and transudes through the amnios where-
 in the embryo swims) till the umbilical vessels and the pla-
 centæ are formed, from and through which the foetus may
 receive nourishment.

This liquor that it imbibes I take to be nutritious juice
 that oozes into the cavity of the uterus out of the capillary
 orifices of the hypogastrick and spermatick arteries, and is of
 the same nature with that which is afterwards separated in
 the placenta, and carried to the foetus by the umbilical vein,
 and with that also which abounds in the amnios even till the
 birth, for the plastick or vegetative virtue is only in the
 ovum itself, and the augmentation that the first lineaments of
 the embryo receive, is only by apposition of this nutritious
 albugineous juice. But this membrane chorion, by that time
 the umbilical vessels and placenta are formed, is grown so
 dense and compact, that it is not capable of imbibing more ;
 but that which at this time is in it, does in small time tran-
 sude into the amnios, and so becomes empty, and gives way
 to the encrease of the allantoides, (which thenceforwards
 begins

begins to appear) whose liquor augments daily as the foetus grows nearer and nearer to the birth, this is my conjecture, which I submit to the censure of the learned.

The amnios is the inmost membrane that immediately contains the foetus. It is not knit to the chorion in any place only where the umbilical vessels pass through them both into the placentæ. It is very thin, soft, smooth and pellucid, and encompasses the foetus very loosely, it has vessels from the same origins as the chorion. It is something of an oval shape.

Before the ovum be impregnated, this membrane contains a limpid liquor, which after the impregnation is out of it the embryo is formed. In it resides the plastick power, and the matter also out of which the first lineaments of the embryo are drawn. But because its liquor is so very little, there transfuses through this membrane presently part of that nutritious albugineous humour that is contained in the chorion, which it had imbibed out of the uterus, as was but even now shewn. And by the juxta-apposition or tradition of this humour to the undiscernible rudiments of the embryo, it receives its increase. But though the amnios have its additional nutritious liquor at first only by transfusion; yet when the umbilical vessels and the placentæ are formed, it receives it after another manner. For then this liquor being separated from the mother's arteries by the placentæ, and imbibed by the umbilical vein of the foetus, it passes directly to its heart, from whence being driven out of the aorta, it is sent forth again, a great part of it by the umbilical arteries, out of whose capillaries dispersed plentifully through the amnios it issues into its cavity, even as far more gross and viscid juices in taking a purge (or sometimes critically) ooze into the intestines out of the small mouths of the arteries; though indeed it be here by the intervention of glands, which 'tis hoped the curious will sometimes discover also in the amnios.

S E C T. XX.

Of the Umbilical Vessels, and of the Nourishing of the Fœtus.

UPON opening the membranes that enwrap the fœtus there appears the navel-string or rope, which is membranous, wreathed and unequal, arising out of the middle of the abdomen, (viz. the navel) and reaching to the womb-liver or placentæ, of a tolerable length, being three spans or half an ell long, and as thick as one's finger. It was convenient to be so long and lax, that when the fœtus in the womb grows strong, it might not break it by its sprawling and tumbling about; and after it is born, the secundines or after-birth might be drawn out the better by it.

The way that it passes from the navel to the placentæ, is very unconstant; for sometimes it goes up to the right hand to the neck, which having encompassed, it descends to the placentæ, and sometimes it goes on the left hand up to the neck, &c. sometimes it comes not to the neck at all, but goes first a little up towards its breast, and then turns round its back, and from thence passes to the placentæ.

The vessels contained in this string, (and which are enwrapped in a common coat, called funiculus or intestinum) are four, one vein, two arteries, and the urachus. As for the nerves which Verhegen suspects to be contained in it, or the lacteal vessels which Bidloo thinks he has observed, I shall not reckon them among these vessels, because these authors speak but faintly of them.

The vein is larger than the arteries, and arises from the liver of the fœtus, (viz. out of its fissure) by the trunk of the vena portæ, and from thence passing out of the navel, it runs along the funiculus to the placentæ, into which it is implanted by innumerable roots; but in its passage it sends some little twigs into the amnios.

The ancients that thought the fœtus was nourished by the mother's blood only, taught the sole use of this vein to be, to carry blood from the placentæ to it: and since it has been found out and believed that it is nourished also (if not only) by chyle or succus nutritius, some have contained the same

office to this vein, and think that the chyle is brought by lacteal vessels arising out of the placenta.

But with this juice there returns so much of the arterial blood (that comes from the foetus) as is not spent upon the nourishment of the placenta, or of the chorion and amnios; which liquors thus mixed, though by the umbilical vein they are poured into the sinus of the portæ, yet are they not distributed through the liver by the usual channels thereof only, but by the venal duct, (described before) are the greatest part thereof conveyed in a direct course and full stream into the cava above the liver.

But besides the uses which are commonly ascribed to these umbilical veins and arteries by anatomists, Verheyen assigns another. Says he, it is worth inquiry, for what purpose the blood of the foetus is sent in such great quantity out of its body into the placenta: seeing without doubt a far less quantity of blood would suffice for its nourishment: for no part in the whole body, if you except the lungs and liver, has such abundance of blood-vessels as the placenta. This must needs be for a certain common use, which we judge to be a kin to the use of the lungs, in those who being born enjoy a freer air: namely, that as these do by the help of the lungs plentifully draw in from the air a certain matter highly necessary for feeding the vital flame; so in the foetus, where the lungs lie idle, such like matter being received into the mother's blood by her respiration, is separated therefrom by help of the placenta, and mixt with the blood of the foetus (in the umbilical vein, &c.): and as in the lungs of breathing persons some heterogeneous matter is continually separated from the blood; so in the placenta certain recrements of blood are deposited out of the umbilical arteries into the veins of the mother.

And here I shall transcribe a material objection with the answer to it, out of Diembroeck.

Obj. * How can these vessels (vein and arteries) when
 * they have grown from the belly of the foetus to that length
 * as to reach the membranes, penetrate and pass through
 * them to the placenta? *Ans.* This is done in the same
 * manner as the roots of herbs, shrubs and trees penetrate
 * into the hard ground, and often into thick planks, walls

‘ and stones, (which water cannot enter) and root themselves
 ‘ firmly into them. For just so the first sharp-pointed and
 ‘ most fine ends of the umbilical vessels insinuate them-
 ‘ selves by little and little into the pores of the membranes,
 ‘ (for the figuration of those pores are fitted for their en-
 ‘ trance) and pass through them, and yet the liquors con-
 ‘ tained in these membranes cannot flow out by them: and
 ‘ when those vessels inhering in the pores grow more out in
 ‘ length, by little and little the said pores are more widened,
 ‘ and are inseparably united unto, and grow in them.’

The fourth umbilical vessel is the urachus or urinary ves-
 sel. This is a small membranous, round pipe, endued with a
 very strait cavity, arising from the bottom of the bladder up to
 the navel, out of which it passes along within the common co-
 ver, & opens into the allantoides. It is more apparently pervi-
 ous in many of the larger brutes than in man, in whom some
 have denied it any cavity; but that it is hollow in him, is
 confirmed by many histories of persons adult, who having
 the ordinary urinary passage along the penis stopt, the pas-
 sage in this vessel has been unclogged, and they have made
 water by the navel, which could not have been imagined to
 have happened, if it had been originally a ligament without
 any meatus. Bartholin and others have affirmed, that the
 urachus in men reaches no further than the navel; how then
 comes that humour into the allantoides, that has perfectly
 the same taste with the urine in the bladder? But their error
 sprung from hence, that they thought a human foetus had
 no allantoides, and that humour that is found in it they
 thought had been contained in the chorion. But this is
 refuted above. As to the perviousness of the urachus I shall
 add this further, that in abortions of five or six months old,
 the bladder of the embryo is always full of urine, out of
 which if in the following months it should not be emptied
 by the urachus, the bladder would soon burst, seeing there
 is daily some serum separated from the blood in the kidneys,
 and sent to the bladder; and the more the foetus increases
 the more must needs be separated. Its use has been suf-
 ficiently declared in the preceding paragraph; as also above,
 when we delivered the use of the allantoides, which we shall
 not repeat.

These

These four vessels have one common cover, which also keeps each of them from touching the other. It is called *intestinulum* and *funiculus*. It is membranous, round and hollow, indifferently thick, consisting of a double coat, (the inner from the *peritonæum*, and the outer from the *parmiculus carnosus*.) Sometimes itself only is wreathed about like a rope, the vessels included in it running streight along its cavity; and sometimes they are wreathed together with it.

It has several knots upon it here and there, which Doctor Wharton thinks to be *papillæ* or little glands, through which the lacteal (or nutritious juice) distils out of the cavity of the amnios. I cannot tell whether this be so or no; but the use that doting midwives make to them, to guess by their number how many children more the mother shall have, and by their colour, whether those children they shall have be male or female, is most ridiculous and superstitious.

When the infant is born, the navel-rope or umbilical-chord, is cut after the following manner. When the length of about a quarter of a yard is extracted, upon drawing away the secundines, a wax thread is passed several times round it, at the length of two or three inches from the child's navel; and again at the distance of two inches from the first ligature, towards the mother; then the cord is immediately cut asunder with a pair of scissars, between the two ligatures.

There have been great disputes among both philosophers and physicians, with what, and by what way the foetus is nourished. Some affirm by blood only, and that received by the umbilical vein; others by chyle only, received in by the mouth: each of which are in an extream. The truth is, according to the different degrees of perfection that an ovum passes from a conception to a foetus ready for the birth, it is nourished diversly.

For first, as soon as an ovum impregnated is descended into the womb, it presently imbibes through its outer membrane some of that albugineous liquor that at this time plentifully bedews the internal superficies of the uterus; so that as soon as the first lineaments of an embryo begin to be drawn out of that humour contained in the amnios, they presently receive encrease by the apposition of the said liquor, filtrated out of the chorion through the amnios into its cavity. And
this

this same liquor that thus encreaseth the first rudiments of the embryo, is called by Doctor Harvey *colliquamentum*. That this way of nutrition or augmentation of the embryo is possible, need not be doubted by him that considers the foetus of a sow has no other way of being nourished till she is near half gone with pig: 'for even till then, saith Doctor Needham, the chorion cleaves not to the womb, but look
' as many foetus as there are, there are so many eggs as were
' without shells, neither sticking to the womb nor to one
' other; but when one opens the matrix, they all tumble out
' of their own accord. There are no glandules, no placentæ.
' But the chorion which is soft and porous, does like a sponge
' imbibe or suck up the serous liquor that sweats out of the
' inmost membrane of the uterus, to be afterwards swallow-
' ed by the veins.' (I suppose he means the mouths of the umbilical vein, after the said is so perfectly formed as to receive it.)

But when the parts of the embryo begin to be a little more perfect, and the chorion becomes so dense that not any more of the same liquor is imbibed by it, the umbilical vessels begin to be formed, and to extend to the outside of the amnios, which they penetrate, and both the vein and arteries pass also through the allantoides and chorion, and are implanted into the placentæ, that at this time, first gathering upon the chorion, joins it to the uterus. And now the hypogastrick and spermatick arteries, that before spued out the nutritious juice into the cavity of the uterus, open by their orifices into the placentæ, where they deposite the said juice, which is absorbed by the umbilical vein, and by it conveyed first to the liver, then to the heart of the foetus, where the inner and more spiritous part of it is turned into blood. But the more gross and terrene part of it descending by the aorta enters the umbilical arteries, and by those branches of them that run through the amnios, is discharged into its cavity. They that will laugh at this passage of nutritious juice, because it is made by this doctrine to choose its way, as if it were some animal or even rational creature, let them avoid the like treatment if they can, while they deliver that the chyle passes immediately either from the mesentery, the receptaculum, or ductus communis to the placentæ, when a foetus is
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in the womb. Pray how should the chyle know, or the lacteals, by which it passes, that there is any foetus in the womb, that the one should offer to go that way, and the other give it way to go thither at that time, whereas the passage is shut at all other times? Yet this my opponents maintain. As also, how comes the chyle presently to turn its course after the foetus is born, and instead of descending to the uterus, ascends to the breast? What mechanical cause can be assigned to these and many other the like phænomena? We must therefore be content to resolve some things into the admirable and unintelligible disposal of our wise creator.

But there lies another objection against this opinion, because it allows none of the mother's blood to be received by the foetus through the umbilical vein, but only succus nutritius; how should blood be first bred in the foetus, seeing it has blood before the liver or heart, or any other part that conduce to sanguification, are in a capacity to perform their office.

I confess it is inexplicable to me how blood should be made so soon; but that it may be, and is made out of the succus nutritius or colliquamentum, without the mixture of any from the mother, is apparent from the most accurate observations of Doctor Harvey, concerning the order of the generation of the parts in a chicken, which from first to last receives nothing from the hen, says he, *de generat. animal. exercit. 51.* 'There appears at the very first a red
'leaping punctum or speck, a beating bladder, and fibres
'drawn from thence containing blood in them. And as
'much as one can discern by accurate inspection, blood is
'made, before the leaping speck is formed; and the same
'is ended with vital heat, before it is stirred by the pulse:
'and as the pulsation begins in the blood and from it;
'so at length at the point of death it ends in it. — And
'because the beating bladder and the sanguinous fibres that
'are produced from it appear first of all; I should think
'it consentaneous to reason, that the blood is made before
'its receptacles; namely the content before its container;
'and that this is made for the sake of the other.

He confesses it to be a paradox, that blood should be made and moved, and endued with vital spirit before any sanguifying

lying or motive organs are in being; and that the body should be nourished and increased, before the organs appointed for concoction (namely the stomach and bowels) are formed: but neither of these are greater paradoxes than that there should be sense and motion in the foetus before the brain is composed; and yet, says he, 'the foetus moves, contracts, and stretches out itself, when there is nothing conspicuous for a brain but clear water.' I say, if all these unlikely things do certainly come to pass in an egg, that has nothing to set the vegetative, or vital principle thereof on work, but the warmth of the hen that sits upon it; why should we think it strange that nutritious juice impregnated with the vital spirits of the arterial blood, with which it circulated through the mother's heart, should be turned into blood in an human foetus (fostered with such kindly warmth in the womb) though it neither receive any humour under the form of blood from the mother, nor have itself as yet any organs of sanguification so perfect as to perform their office? But to proceed.

The grosser nutritious juice deposited by the umbilical arteries in the amnios, as soon as the mouth, gullet, and stomach, &c. are formed so perfectly that the foetus can swallow, it sucks in some of the said juice, which descending into the stomach and intestines is received by the *venæ lactæ*, as in adult persons.

That the foetus is nourished this way, Diembroeck evinces by these reasons.

'First, because the stomach of the foetus is never empty, but is found posselt of a milky whitish liquor; and such like is contained even in its mouth.

'Secondly, because there are faeces contained in the intestines, (which philosophers call *meconium*) which the infant as soon as 'tis born voids by stool. Without doubt these are the excrements of some aliment taken in by the mouth.

'Thirdly, because the stomach could not presently after the birth perform the function of concoction, if it had not at all been accustomed to it in the womb.

'His fourth reason, supposing the foetus to be nourished in part by the mother's blood, I shall not recite, because
I think

• I think that to be an erroneous opinion, as I shall endeavour
 • to make appear hereafter.

• His fifth reason, because the infant as soon as it is born
 • knows how to suck the breast, which it could not be supposed
 • to be so dexterous at, if while it remained in the womb it
 • had taken nothing by suction.

• Sixth, because many infants, as soon as they are born, be-
 • fore they have sucked any breast, or taken any thing by
 • the mouth, vomit up a milky aliment: which therefore
 • must needs be received into their stomach in the womb.

This he gives an instance of in one of his own children.

These arguments I think sufficient to prove what they are alledg-
 ed for; but when he would afterwards prove that the foetus is also
 nourished by the mother's blood conveyed by the umbilical vein, I
 think his reasons are invalid. For he says it must be so, first, be-
 cause the said vein is implanted into the placenta; (but this is but
 begging the question, for 'tis necessary it should be implanted into
 it, though it receive nothing from it but nutritious juice.) Secondly,
 because of the great quantity of blood that will issue out of the um-
 bilical vein, if one tie the navel-rope, and then open the said vein
 betwixt the ligature & placenta: for he says, there will flow out four
 times as much blood as could be supposed to be contained in the small
 arteries on the side the ligature next the placenta. I answer, that
 first one would be well satisfied that the ligature was made so tight
 that there could no blood pass through it from the foetus to the
 placenta. And thirdly, it cannot exactly be guessed how much
 blood may be contained in the foetus's arteries in the placenta, so as
 that one should be certain that there does four times more flow out
 by the vein. But lastly, suppose there do four times as much more
 blood issue out of the vein as is contained in the foetus's arteries that
 are on that side the ligature, next the placenta, and this blood come
 from the mother's hypogastrick and spermatick arteries; I say, there
 will not only four times, but forty times as much issue there-
 from, for all the blood of the mother might then be drawn out this
 way. Wherefore I think this experiment makes much more against
 his opinion than for it. His next reason is, the necessity of it; be-
 cause, as the foetus encreases, it needs much aliment, and its weak
 bowels can concoct but little, it must therefore have some purer ali-
 ment, and which is already concocted (he means blood) to nourish
 it, and by its commixture to help forward the changing the aliment
 received by the mouth into blood. *Ans.* This reason he himself in-
 validates in the next paragraph, where he confesses that the foetus in
 the womb is nourished, in the same manner as the chicken in an egg,
 which receives encrease first by the inner white (as he distinguishes)
 I by

by way of apposition ; secondly, it receives nourishment in by the mouth from the outer white, and at the same time its umbilical vessels enter the yelk, (to draw nourishment from thence) which, he says indeed, resembles the mother's blood ; but seeing it has not the least form of blood ; why would it not be more plausibly said that it is instead of the *succus nutritius* that the foetus in viviparous animals receives by the navel-vein ? And seeing these several liquors are turned, part of them, into blood in a chicken, without any of the hen's blood to ferment them (as he speaks ;) why should not the same power be granted to the vegetative or animal soul of the foetus in the womb, without any assistance from the mother's blood ? To which I shall add another argument (out of Doctor Harvey) taken from Cæsarean births, when living infants are cut out of their mother's womb, after she is dead. For if it had its life and heat from the mother's blood ; surely it should die as soon as she at least, if not sooner: for when death approaches, the subordinate parts do languish and grow cold before the principal ; and therefore the heart fails last of all. Wherefore the blood of the foetus would first lose its heat, and become unfit for its office, if it were derived from the mother's womb ; seeing the womb is destitute of all vital heat, before her heart.

But some may object, if the foetus be nourished by none of the mother's blood, why should her menses be stopt all or most of the while she is with child ? To which I answer, that 'tis for the same reason that nurses that give suck commonly want them also ; for as in nurses the chyle passes in a great proportion to the breasts, whereby the blood being defrauded of its due and wonted share does not encrease to that degree as to need to be lessened by the flowing of the menses ; so in women with child, there is so great a quantity of the *succus nutritius* (which with vital spirit) that passes to the placenta by the hypogastrick and spermatick arteries for the nourishment of the foetus, that unless the mother be very sanguine, her menses intermit after the first or second month.

I shall conclude therefore, that the foetus is nourished three several ways, but only by one humour : First, by apposition of it, while it is yet an imperfect embryo, and has not the umbilical vessels formed ; but after these are perfected, it then receives the same nutritious juice by the umbilical vein, the more spiritous and thin part whereof it transmutes into blood, and sends forth the grosser part by the umbilical artery into the amnios, which the foetus sucks in at its mouth, (after the parts of the mouth, the gula, ventricle, &c. are formed sufficiently for such an action,) and undergoing a new concoction in its stomach, is received out of the intestines by the *venæ lactæ*, as is done after the birth.

S E C T. XXI.

Of the Birth.

THE foetus swimming in the liquor of the amnios, and the navel-rope being so long, it must needs have scope enough to change its situation, and that is the reason that anatomists differ about it, but according to Dr. Harvey, its usual posture is thus :

‘ Its knees are drawn up to the belly, its legs bending backwards, its feet across, and its hands lifted up to its head, one of which it holds to the temple or ear, the other to the cheek ; where there are white spots on the skin as if it had been rubbed upon. The backbone twines round, the head hanging down towards its knees. Its head is upwards, and its face commonly towards the mother’s back.’

But towards the birth (sometimes a week or two before) it alters its situation, and tumbles down with its head to the neck of the womb, with its feet upwards. Then the womb also settles downward, and its orifice relaxes and opens. And the foetus being now ill at ease sprawls and moves itself, whereby it tares the membranes wherein it is included, so that the waters (as they call them) flow into the vagina, which they make slippery for the easier egress of the infant : though sometimes the membranes burst not, but come forth whole, as they do commonly in brutes.

At the same time the neighbouring parts are loosened and become fit for distention : the jointings of the os sacrum and pecten with the coxendix, as also of the ossa pubis, are so relaxed, that they yield very much to the passage of the foetus. And its motion gives that disturbance to the uterus, that presently the animal spirits are sent plentifully by the nerves to its constrictory fibres, and the muscles of the abdomen, which all contracting together, very strongly expel the foetus, (which in the most natural birth) goes with the head foremost : and if the feet or any other part (besides the head) do offer itself first, the travail is always more painful and dangerous.

The several sorts of creatures have sundry terms of going
I 2 with

with young: the stated and most usual time of women is nine months; though some bring forth some weeks sooner, and others later. But when it is given out that perfect and sprightly infants are born at seven months end; it is either to hide the faults of some new married woman, or from the mistake of the ignorant mother. As also when sometimes the mother has affirmed herself to go eleven months or upwards, it is either through mistake, or to keep fast some fair estate, when the pretended father's dead without an heir, for which the cunning widow plays an after-game.

Divers reasons are given why the foetus at the stated time of birth is impatient of staying any longer in the womb. As the narrowness of the place, the corruption of its aliment, or the defect of it, the too great redundance of excrements in the foetus, and the necessity of ventilation or breathing. All these are plausibly defended by their several authors. But without blaming ingenious men for exercising their wits on such a subject, we choose however rather to be content with resolving all into the wise disposal of the great creator. Whose power and wisdom were not more eminent in creating man at first out of the dust of the earth, than out of those principles, and in that method whereby he is produced in ordinary generation.

A Prescription for the Restorative Medicine.

TAKE of green rosemary and lavender flowers of each two ounces and a half, four nutmegs in fine powder, satyrion root sliced small four ounces, gum benjamin and storax, of each one ounce and two drachms, of balsam peru one drachm, musk and amber-grease of each one scruple, put them all into five pints of viper wine, and let it stand in a chimney corner or some very warm place (close stopt) for a month, or two, then decant for use.

This is as great a Restorative as Medicine can produce, and those who stand in need of such a Medicine, can't purchase a better, even for its weight in gold.

In the last decays of life it will supply the vital lamp with some recruit. And it is an admirable remedy for those who have been almost worn out with venereal engagements, especially

pecially if their pleasures have been purchased at the expence of a few salivations, or a too frequent use of mercurial medicines; and it will revive any constitution that is not quite mouldered into rottenness. But they best deserve such restorative, who, by acute diseases, have been so broke or shattered in their constitutions as hardly to be within a possibility of recovery. For in such it will to admiration repair the decayed juices, and fill again the veins with warm generous, nutritive blood. Even those who are leaning towards a consumption, and where young persons are not so early happy in their conjugal embraces, as some wish to be, and it be suspected from a coldness or insufficiency upon that account on either side, the use of this grand medicine cannot fail to render those intercourses prolific; but the use of it is warily to be indulged, lest with it be kindled an heat, which reasonable coition cannot assuage. And let such likewise who indulge themselves too lavishly in those enjoyments, be careful how they prompt with such helps, lest they run off their strength and life too precipitantly; for the best constitutions in the world wear out, and sink under the frequent repetition of such profusion; as the frequent straining any elastic body whatsoever, will weaken more and more its spring, till it is quite lost, notwithstanding all the helps of art to preserve it. QUINCY.

Note, The dose is from half a spoonful, to a whole one, in a glass of white wine, twice a day.

Remark, Be very careful of what Chymist or Druggist you purchase the Medicines from, for in case they are not genuine you will be deceived both ways; have every thing separate, and mix it yourself.

F I N I S.



A D V E R T I S E M E N T.

WHEREAS there are a number of Medicines advertised for the cure of the Venereal Disease, which only impair, and destroy the constitution of those who take them, to the great shame of the venders who thrust them upon the unwary.

The Medicine mentioned in this Essay, called Gutta Salutaris, or Royal Anti-Venereal Diuretic Medicine, is now in the greatest repute, it is therefore earnestly requested that the afflicted will be very particular in regard of the use of it, according to the direction given with each bottle, and they will soon find the greatest relief in taking it, even from a simple clap, to the highest stage of the cruel disorder.

It purges the blood and lymph from all heterogeneous viscidities, and by restoring them to their proper crisis for the solids to act in, restores these also to their due firmness and elasticity. — Such a mode of operation extends to every chronic ailment — it perfectly eradicates the venereal disease in all its horrid stages and symptoms, and that without tearing the constitution like mercury, whose pernicious effects too often make the cure it works with little service to the unhappy patient.

This grand preparation soon removes the root of the disorder however inveterately blended in the blood, or however broken out in tumours, blotches and ulcers, and let the patients make a parade of precluding imitation. The composition of this is above the reach of imitators.

None of the medicine is genuine that is not sealed with the Freeman's coat of arms, & every bill of direction with each bottle signed with the Doctor's name in his own hand writing.

The medicine (with or without this Essay) is sold by the Authors appointment, in bottles of five shillings, and three shillings each, at the following places, viz.

By G. Cummings, No. 2. Ludgate-street; Mr. Blythe, Bookseller, near the Royal Exchange; Mr. Davis, Bookseller, in Holborn;

born; Mr. Jackson, Stationer, Oxford-road; Mr. Gardner, Bookseller, near St. Clement's Church, Strand; Mr. Turpin, in St. John's-street, Smithfield; Mr. R. Davis, Bookseller, in Piccadilly; Mr. Woodfall, Charing-Cross; Mr. Pace, Printer, No. 181, in Bermondsey-street, near London Bridge, Southwark; Mr. Newbery, corner of St. Paul's Church-yard, Ludgate-street, London.

And by the following Printers, and Booksellers, in the Country, Chase, Printer, at Norwich; M. Swinney, Pearson and Rollason, at Birmingham; Berrow, at Worcester; Raikes, at Gloucester; Harrop, at Manchester; Cocking and Pine, at Bristol; Cruttwell, at Sherborne; Grigg, at Exeter; Hayden, at Plymouth; Carnan and Co. at Reading; Cruttwell, at Bath; Peter Hoey, at Dublin; Saint and Barber, at Newcastle; Etherington, at York; Fleming, at Edinburgh; Ward, at Nottingham; Worly, at Preston; Langford, at Jamaica; and in most capital towns in England, Ireland, and America.

P. S. Captains of ships and others may be supplied at the above places, and have good allowance to sell again, as they will find it a profitable commodity to carry both it, and the books with them.

